▼ UNION OF AMERICAN REPUBLICS ▼

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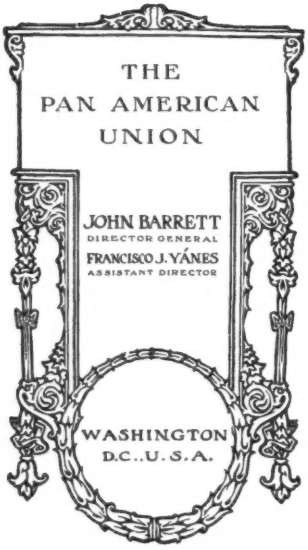

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TABLE OF CONTENTS

Page.

Pan American Notes 1

Results of meeting of International High Commission in Buenos Aires—Resolution adopted by the Missouri Bankers Association—Transocean Finance and Commerce Corporation—To teach Portuguese at Illinois University—Department of tropical forestry at Yale—Effect of European war on Argentine foreign shipping—"The Significance of a Pan American Policy."—United States Return Visit Committee to Brazil.

Navigation on South American Rivers 13

Maize—The Greatest of American Food Products 33

What Central America Buys 54

The African Mahogany, a Promising Tree for Tropical America 71

The Pan American Railway 77

Pan America in the Magazines 79

Cuba's new rival for jute—The country of the shepherds—The oldest dated American monument: A nephrite figurine from Mexico—Improvements in deep-sea diving.

Book Notes 105

Subject Matter of Consular Reports 108

Argentina 109

Election of President and Vice President—National census—Sales of real property—Gold reserve—Finances of Province of Cordoba—Railway extension—Postal savings bank—First National Medical Congress—Proposed agricultural colony—Works commemorating centennial celebrations—Highway—National Congress of Engineering—Visit of United States business men—American Bibliographical and Historical Congress—School for workmen—Proposed plant for manufacture of Portland cement—Art exposition—Cattle census—Freight traffic—Library of Social Argentine Museum.

Bolivia 111

International train service—Automobile service on Oruro-Cochabamba line—Wireless station—National educational exhibition—Oil lands concession—Mining activities—United States return visit committee—Cultivation of sugar cane—Representation in Child's Congress.

Brazil 113

President's message—Opening of Botanic Gardens—Coffee exports—Lyceum of Arts and Crafts—Water and sewerage systems of Recife—Industrial census of Sergipe—Population of Rio de Janeiro—Exports.

Chile 114

Sack and bag factory—Railway receipts—Packing establishment—Nitrate exports—Education of Chilean students abroad—Proposed railway construction—Agricultural magazine—Industrial school—Consular appointment—Santiago public library—Mercurial ores—Proposed university—Consular appointment—Coastwise trade.

Colombia 116

Extra session of National Congress—Consular appointment—Gold exports—Tax on tobacco—Fair—Treasury notes—Tobacco tax—Departmental insane asylum—Sanitary station for Buenaventura—Port Dorado—Railway extension—New telephone offices—Old paper currency destroyed—Bust of Cervantes.

Costa Rica 117

Officers of Central American Court of Justice—Commercial conditions—School of Agriculture—Oil and mining conditions—Professional School for Girls—Proposed Portland cement factory—First official school building—Concessions approved—Loan credit.

Page.

Cuba 119

Wireless installation—Ferryboats—Tuberculosis sanitarium—Bank dividends—New Habana University building—Proposed electric railway extension—State wharves—Establishment of legations—Employer's liability law—Telephones—New school building—Hydrographic survey—Appropriation bills signed—Parcel-post packages—Proposed tax on advertisements.

Dominican Republic 122

Publication of laws—Discovery of ore deposits—Municipal vaccination office—Branch of Royal Bank of Canada—Dominican Central Railway—Santiago de los Caballeros Water Company—Freight tariffs on Campeachy wood—Postage stamp issue.

Ecuador 124

Mutual Aid Society of Azogues—Telephone service—Wireless station—Public works—Society of School of Medicine—Bureau of Sanitation—Celebration of Labor Day—Cacao production.

Guatemala 125

Powers conferred on President—Mintage of copper coins—Wheat cultivation—Freight tariffs on lumber—Report of electric light company—Foreign commerce—Reduction of duty on cotton bagging—Companies licensed—Demographic statistics—Postal tariff.

Haiti 126

Reorganization of cabinet—Vessels for coastwise service—Board of state counselors—Paper currency—Changes in names of Port-au-Prince streets—Proposed consolidation of postal and telegraph services—Classical and professional instruction—Commercial situation—Consular appointment.

Honduras 128

Agricultural school—Areas under cultivation—Production of staple articles—Scholarship—Coconut plantation leased—Telephone equipment—Gaseous water factory—Coconut lands leased—Subvention of Santa Rosa hotel—Petition to establish wharf—Musical concert at United States Legation.

Mexico 129

Wireless stations—Petroleum deposits—Site for international college—School of librarians—Divorce law—Speculation prohibited—Mazatlan customhouse—Schools for workmen—Cultivation of cotton—Decree regarding consular invoices—Establishment of schools—Mining taxes—Raw cotton—Revalidation of patents.

Nicaragua 131

Customs receipts—Mining company's activities—Sawmills—Investigation of banana industry—Municipal night school—Railroad contract—Colonization company—Railway construction—Sponge fisheries—Cyanide plant.

Panama 132

Agricultural settlement—Cacao cultivation—Hot springs—Mahogany—Commissaries—Garbage-disposal plant—Salvation Army—Liquor imports.

Paraguay 133

Orange imports—Students in Uruguay—Botanical and Zoological Garden—Typographical society—Commercial conditions—Proposed penitentiary—Regulation of wireless stations—Asuncion-Corumba steamer service—Shipment of calves to Argentina—Portland cement—Anniversary of independence—Daily newspaper.

Peru 135

Commission—Bullion exports—Railway extension—Agreement with banks—Session of Congress—Wheat cultivation—Decorations conferred—Municipal elections—Monument to Ladislao Espinar—School rifle clubs—Steamer service—Monument to Garcilaso de la Vega.

Salvador 136

Permanent boundary line—Free entry of Peruvian bark, sulphuric acid, and quinine—Replanting of forests—National highway—College for girls—Representative at Argentine centenary celebration—Gold mine—Petroleum deposits—Henequen plantation—Railway construction—Export taxes—Arms and explosives.

Uruguay 138

Budget—Education system—Import consular regulations—Stock fair—Potable water for Lacaze—National School of Painting and Sculpture—Monument to Artigas—National Library in Montevideo—Tobacco growing advocated—Receipts of Montevideo waterworks.

Venezuela 139

Election of archbishop—Navigation company's bond issue—Vargas prize—Second Venezuelan Medical Congress—Magnesia deposits—Repairing levee—Cotton gin—Degrees of mining engineer—Copper ore shipments—Chicle exports authorized—Opening of highways—Sugar central—Road repairs.

Photo by American Photo Co.

THE MACEO MONUMENT, HABANA, CUBA.

On May 20, 1916, the Cuban people celebrated the fourteenth anniversary of the day upon which was established their complete autonomy. In Habana the chief feature of the celebration was the unveiling of the Maceo monument, erected in honor of one of Cuba's greatest heroes, Antonio Maceo. The monument, designed and executed by the Italian sculptor, Domenico Boni, is said to be one of his most artistic works. It consists of a large bronze equestrian statue of Gen. Maceo, mounted on a splendid marble column bearing the inscription and ornamented by the bronze figure of a Winged Victory attended by her supporters—Justice, Patriotism, Action, Sacrifice, and Thought. The base is ornamented by a number of symbolic figures in bronze.

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RESULTS OF MEETING OF INTERNATIONAL HIGH COMMISSION IN BUENOS AIRES.

PLANS for vigorously and effectively carrying forward the work of the International High Commission were made by Secretary McAdoo and the other members of the central executive council and the United States section of the commission at a meeting held in Washington June 15.

This was the first meeting of the central executive council, which was created at the Buenos Aires meeting of the commission in April. The commission has a section in each American Republic, and the central executive council represents the governing authority to keep in touch with the various sections and direct the general work.

Secretary McAdoo is president of the council, Prof. John Bassett Moore is vice president, and Dr. Leo S. Rowe is secretary general.

In addition to the above mentioned, the meeting of the United States section of the commission was attended by the following members: Senator Duncan U. Fletcher; Andrew J. Peters, Assistant Secretary of the Treasury; Paul M. Warburg, member of the Federal Reserve Board; John H. Fahey, of Boston.

The council and the United States section reviewed the important achievements of the Buenos Aires conference and resolved that no effort should be spared to obtain practical results in strengthening the financial and commercial relations of the American Republics and in bringing about uniformity of legislation in matters affecting Pan American trade and commerce.

It was decided to take up immediately with the State Department the question of negotiating treaties with the Republics of Latin America for the creation of gold trust funds between the different American countries, similar in some respects to the gold settlement fund maintained by the Federal reserve banks at Washington and administered by the Federal Reserve Board. Such international gold trust funds would prove of the greatest convenience and assistance to commerce in connection with exchanges, saving unnecessary

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CELEBRATING THE CENTENARY OF ARGENTINE INDEPENDENCE.

The above picture shows the capitol and plaza in Buenos Aires, illuminated by searchlights in honor of the celebration of the 100th anniversary of the declaration of independence, on the night of July 9th, 1916. It was just 100 years ago that the National Constituent Congress assembled in a little building in Tucuman for the purpose of adopting and signing the historic document which gave birth to the Argentine nation. The Congress had assembled on March 24, 1816, and after 3½ months of deliberation drafted the Declaration of Independence, which every delegate signed on the day of adjournment—July 9. Over four years prior to this event, however (May 25, 1810), the last Spanish Viceroy, Cisneros, had been deposed by the patriots of Buenos Aires and a provisional directory had assumed the reins of power and continued its functions until the formal Declaration of Independence paved the way for the establishment of a republican form of government, the adoption of the constitution, and the election of the officials of the executive, legislative, and judicial branches. May 25th was therefore also made a national holiday.

transfers of gold in settlement of balances, with all the attendant loss and expense.

In working out the plan for gold trust funds, the unit of money of account equaling one-fifth of the American gold dollar, which was approved at the Buenos Aires meeting as a standard for the American Republics, will be of great value. If this unit is adopted by the various countries as a standard money of account, it will provide a uniform basis for transactions between all of the countries of Latin America and of North America, and also will offer a basis likely to be adopted for the actual coinage of gold by the various countries as they find themselves able to put into effect a gold currency system of their own.

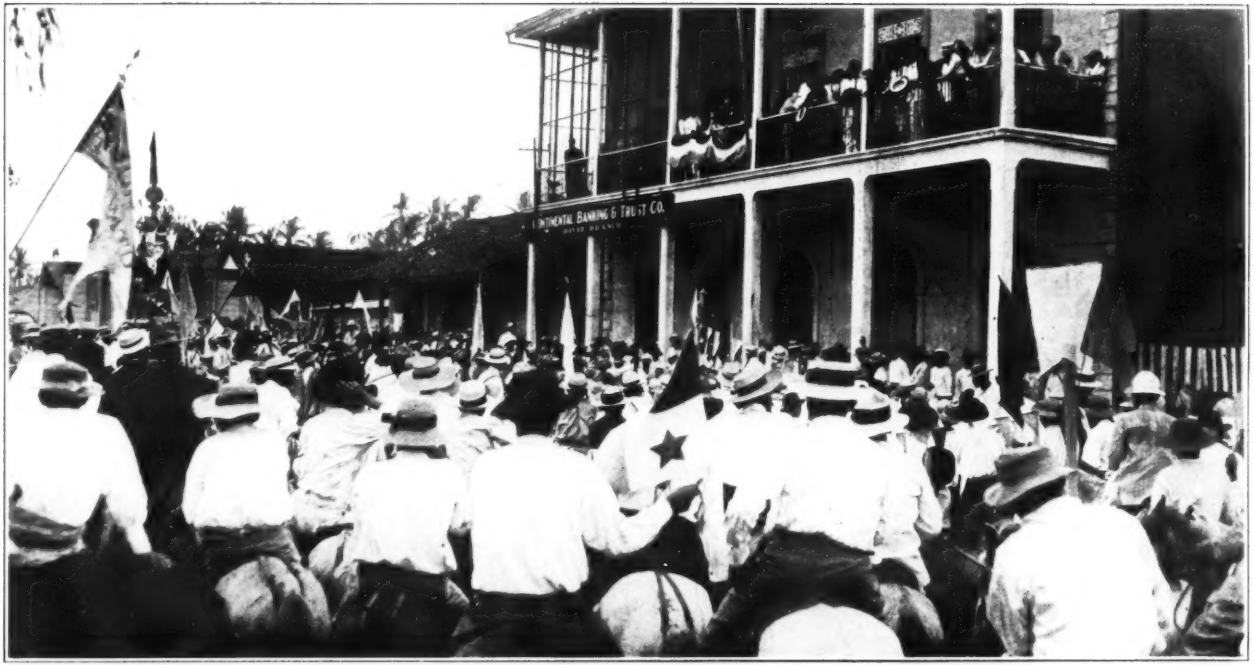
The council also decided to undertake, through the State Department, the negotiation of treaties to facilitate the work of commercial travelers and to abolish license fees which now exist in many countries, as well as the numerous onerous restrictions upon the admission and circulation of samples of American goods. If these treaties can be negotiated, it will be a great accomplishment in the promotion of financial and commercial relations between the United States and Latin America.

The United States section of the commission will also recommend to Postmaster General Burleson that steps be taken to provide for the representation of the United States at the proposed postal conference to be held in Montevideo, in accordance with the recommendation of the International High Commission.

Secretary McAdoo has already made plans to put into effect at once the recommendations of the Buenos Aires Conference with reference to the uniform nomenclature of classification of merchandise for the purpose of commercial statistics, and in this relation will utilize the standard monetary unit of account. Illustrating the progress made, this plan will be put in force by the Secretary in connection with the statistics for the calendar year 1916, and will afford means of intelligent comparison with similar statistics in the other Latin American countries which will adopt the uniform nomenclature approved by the Buenos Aires Conference.

The central executive council and the commission will recommend to the Secretary of State that steps be taken for the adoption by the United States and the various countries of Latin America of the resolutions on customs modification, including the model consular invoice, agreed upon in 1910. Only a few countries have ratified the resolutions, and their ratification by the remaining countries of the Western Hemisphere will greatly facilitate the transaction of business among them and simplify customs procedure.

The council will also take up the question, through the State Department, of securing ratification of the important patent, trade-



PRESIDENT PORRAS, OF PANAMA, DELIVERING AN ADDRESS AT THE INAUGURATION OF THE CHIRIQUI RAILROAD, AT DAVID, CAPITAL OF CHIRIQUI, APRIL 22, 1916.

The official inauguration of this first national railway of Panama took place April 22–29, 1916, and was marked by memorable celebrations and impressive ceremonies. The President, cabinet officials, diplomatic officers, and high Government officials traveled from Panama to David to participate in the event. A trip over the entire line was made and the various bridges, shops, and auxiliary public works were inspected. On the night of the 25th Mr. R. W. Hebard, of the constructing firm, tendered a banquet to the President and cabinet and this was followed by a State ball given by the people of the Chiriqui to these distinguished officials.

mark, and copyright conventions of 1910 and the pecuniary claims convention of the same year.

With reference to the question of extension of the arbitration of commercial disputes between citizens of the Pan American countries through their respective commercial bodies, which was approved by the Buenos Aires meeting, the council will take up with the Chamber of Commerce of the United States the important problem of securing the favorable action by other chambers of commerce than that of Buenos Aires with which such an agreement is now in working order. The National Chamber of Commerce of Uruguay has already announced its intention to enter into such a convention with the United States Chamber of Commerce.

While, of course, these arrangements are of an unofficial character and between commercial bodies, the Chamber of Commerce of the United States will receive the cooperation of the central executive council in perfecting the arrangements.

RESOLUTION ADOPTED BY THE MISSOURI BANKERS' ASSOCIATION.

The Pan American Union has received a letter from W. F. Keyser, secretary of the Missouri Bankers' Association, inclosing a copy of the following resolution unanimously adopted by the Missouri Bankers' Association at its convention assembled in St. Louis on May 24, following an address delivered by the Director General upon the topic of "Pan Americanism and what it means to the Central West of the United States":

Whereas the Missouri Bankers' Association appreciates the great importance of the work of the Pan American Union, both in fostering and cementing closer international relations among the different Governments of the American Continent, and also the practical value of such work to the business interests of the United States as a whole, and the Middle West in particular: Therefore be it

Resolved, That this association hereby heartily indorses the aims of the organization named and approves the idea of their further prosecution and enlargement.

In view of the fact that this organization is one of the largest and most powerful of its kind in the United States, and that this resolution was passed entirely upon the initiative of the association, it has a special significance which will be gratifying to all those who watch with satisfaction the growth throughout the United States of interest in the relations of that country with its sister American Republics.

TRANSOCEAN FINANCE AND COMMERCE CORPORATION.

A New York organization for the purpose of initiating and promoting financial relations with the Republics of Latin America has recently been incorporated under the name of the Transocean Finance and Commerce Corporation. Heading the enterprise as its officers

are men well known in financial circles of the United States and intimately acquainted with conditions in the countries where they plan to operate. The corporation proposes to assist the countries to the south in solving arising financial problems and to develop its business along the lines adopted by European banking houses. As part of the business operations it is proposed to make advances on crops and products, to place mortgages on real property, to negotiate Government transactions and contracts, and to aid in developing mining, electrical and hydraulic opportunities, as well as railroad construction. Among the officials of the corporation, which has its headquarters at 63 Wall Street, New York City, are Frank B. Wiborg, president; John Adams Dix, Theodore May, and Sidney W. Fish.

TO TEACH PORTUGUESE AT ILLINOIS UNIVERSITY.

Announcement has been made by the University of Illinois, of Urbana, Ill., that the department of Romance languages will offer courses in Portuguese during the coming academic year. A native of Portugal has been appointed instructor, and the hope is expressed that there may be as much interest shown in this language as there is in the Spanish classes. While the latter is taught in a majority of leading college and universities, the number of institutions offering the Portuguese language is yet small, but it is encouraging to note that the growth is gradual and steady.

DEPARTMENT OF TROPICAL FORESTRY AT YALE.

A special department for instruction and research in tropical forestry has recently been initiated by the Yale School of Forestry. As far as can be ascertained this is the first professional institution to establish a regular course in this branch of study, and it is planned to even organize field parties to conduct the researches in the forest lands of South and Central America. The field of tropical forestry is almost untouched, and as there are growing intimations that the vast forest lands, both State and National, of these tropic countries are to be developed, the training of young men for a thorough and technical knowledge of forestry to enable them to place this science on a permanent basis in these countries has become a necessity. According to the present requirements of the school, a student must have completed at least three years of collegiate work to become a candidate for the degree of Master of Forestry. Special students, not candidates for the degree, will be admitted with less scholastic preparation. Further particulars and a descriptive catalogue covering this department may be obtained by application to the Yale School of Forestry, New Haven, Conn.

EFFECT OF THE EUROPEAN WAR ON ARGENTINE FOREIGN SHIPPING.

The tonnage of foreign vessels, entrances and clearances, entering the ports of Argentina for the year 1913, just prior to the European war, was 27,007,000 metric tons. In 1915 this tonnage had fallen to 18,866,000 tons, a loss in shipping of 8,141,000 tons. In 1913, 24,811,000 tons of the total tonnage, or nearly 92 per cent thereof, was under the flags of the now belligerent countries, namely, the United Kingdom, Germany, Austria, France, Italy, and Belgium. In 1915 the tonnage under these flags represented 13,304,000 tons, or 70 per cent of the tonnage for that year. The net loss of vessels under the belligerent flags was 11,507,000 tons. As an offset to this there was an increase in tonnage under flags of neutral countries of 3,484,000 tons. The largest increase, amounting to over a million, was in vessels under the Dutch flag, the next largest under the Norwegian, the third under the Greek, and the fourth under the United States flag. The increase under the United States flag, however, represented a larger percentage of increase than that under any of the other flags—an increase from 27,000 tons to nearly 500,000. The following table shows the tonnage for the two years under comparison, the increase, and the decrease:

[000 omitted.]

Nationalities.	1913	1915	Increase, 1915.	Decrease, 1915.
	Tons.	*Tons.*	*Tons.*	*Tons.*
United Kingdom	18,433	11,094	.....	7,339
Germany	2,840	16	.....	2,824
Austria-Hungary	565	2	.....	563
France	1,182	775	.....	407
Italy	1,444	1,148	.....	296
Belgium	347	269	.....	78
Netherlands	446	1,494	1,048	.....
Norway	498	1,023	525	.....
Greece	74	556	482	.....
Spain	430	755	325	.....
Sweden	114	327	213	.....
Portugal	3	3	.....	.....
Denmark	130	188	58	.....
Russia	44	71	27	.....
United States	27	499	472	.....
Uruguay	127	343	216	.....
Paraguay	.....	74	74	.....
Brazil	65	106	41	.....
Chile	108	111	3	.....
Other	130	12	.....	118
Total	27,007	18,866	3,484	11,625

THE SIGNIFICANCE OF A PAN AMERICAN POLICY.

Hon. William G. McAdoo, Secretary of the Treasury, delivered the commencement address at the graduation exercises of the University of North Carolina, at Chapel Hill, on May 31, 1916, chosing as his subject "The Significance of a Pan American Policy."

After a few appropriate remarks on the importance of an enlightened public opinion concerning the relations with the countries of Central and South America, and on the intellectual sympathy mani-

Courtesy of Bureau of Commercial Economics.

GIANT WREATH DECORATING THE WASHINGTON MONUMENT.

In the United States May 30 has been made a national holiday, known as Decoration Day, in honor of the men of the United States Army and Navy who fought in defense of the Union during the Civil War. The graves of the dead soldiers and sailors in all national and private cemeteries in the country are decorated with flowers and American flags with appropriate attending ceremonies. In Washington, D. C., the exercises of the day were this year concluded in the evening by an exhibition of moving pictures showing the beautiful scenes of the various national parks and reservations in the country. The Washington Monument, a shaft 555 feet high and 55 feet square at the base, served as the support for the huge screen, inclosed in a wreath 34 feet in diameter, made of spruce and hung with laurel rope. Thousands of spectators gathered on the slope in front of the great monument to view these remarkable pictures of the picturesque wonders of their own country, and when the picture of George Washington was thrown on the screen gave vent to their patriotic enthusiasm in prolonged cheers.

fested during the recent Pan American Scientific Congress, Secretary McAdoo said:

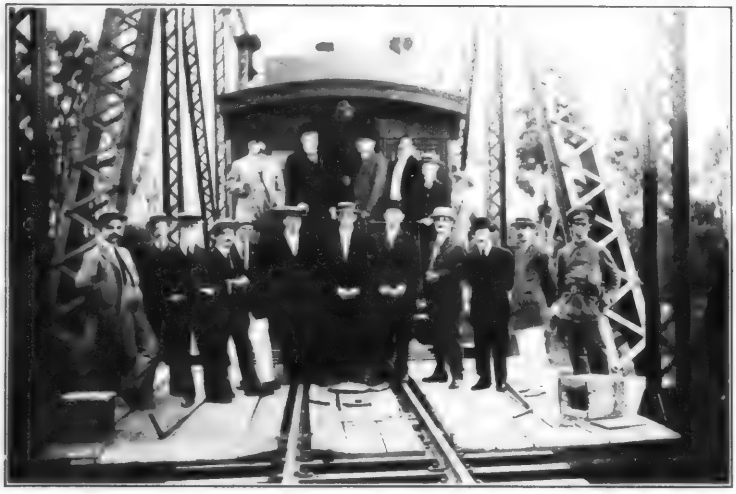
During the last quarter century we have seen revived in the United States a remarkable consciousness of a position our Government took over 90 years ago. To men of the present generation the Monroe doctrine is a familiar phrase, and you have a notion, more or less clear, of what it means. You associate it, and most of us have become accustomed to associate it, with a settled policy upon the part of our Government to discourage any explicit or implicit policy on the part of a non-American State to extend its political system, or even such elements of control as would in fact constitute an extension of its political system, to territory within this hemisphere. That is the great central feature as we understand it of the Monroe doctrine, and we do not intend that in its essence that doctrine shall be changed. Europe, or, more accurately, the world outside of the American Hemisphere, has acquiesced in that principle.

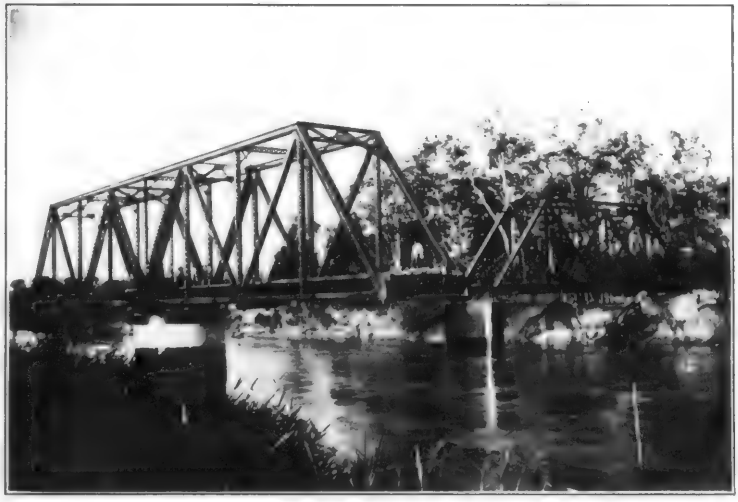
Within these last 20 years there have come a succession of incidents which have borne home upon our people more and more the necessity of taking serious thought as to what was meant originally by the Monroe doctrine, and what it has meant since, and *what, in short, must be the basis of our relation with the Republics to the south.* It is not my purpose to burden you with an academic discussion of the political theory with which one must necessarily deal in discussing the various aspects of the Monroe doctrine, because my recent visit to South America has destroyed any academic notions I may have entertained about the position of the Latin American States in recent years. The wealth and solidity of those nations, their thriving industry and evident prosperity, the splendid contributions of their thinkers and reformers to the solution of the world's most pressing social problems, the unmistakable evidence that there is being created in South America a middle class with high standards of living and excellent balance and judgment in public matters, comparing favorably with any in the world, their rich, ancient, and homogeneous civilization—all these have impressed me too deeply to speculate upon theoretical inferences from the principle that has guided our relations with South America.

What one or another theorist may say as to the danger to Latin America from the Monroe doctrine or from the wealth and power of the United States is no longer of interest when one thinks of what Latin America actually signifies to-day. It has taken its place in the councils of the world; its good opinion is diligently sought at this very time by both sides in the European struggle; and while in 1899 Latin America was generally ignored in the calling of the First Hague Conference, in 1907 nearly all the Republics were invited to send representatives. The larger and wealthier among them had long before achieved a distinct position in the world's affairs; but what is more important all South America had achieved an individuality, had risen above a mere geographical expression to signify a living, creative force. * * *

The Secretary then pointed out the part this country had taken in that evolutionary progress and outlined the series of international conferences which culminated in the Fourth Pan American Conference at Buenos Aires in 1910. Continuing, he said:

No doubt could remain, and I am happy to say that practically no doubt does remain, in the Latin American world that we have sought to treat all the Governments of America on a basis of equality and cooperation. We have looked with sincere gratification upon the emergence of individual States into positions of economic and political eminence, just as we look with equal satisfaction and serenity upon the evident desire of the Latin American world to share with us upon terms of equality the responsibilities and the glories of maintaining the highest principles that have guided us all in creating organized government in this hemisphere.





A NEW DRAWBRIDGE OVER THE CAUCA RIVER IN COLOMBIA.

Upper: Showing group of officials of the Colombian Government and officers of the railroad when the bridge was officially turned over to the Pacific Railway Co. by the United States contractors who built it. Lower: Showing the draw of the bridge turned to permit the passage of vessels on the Cauca.

But not content with an honorable, traditional policy and a genuine national satisfaction in the friendship of the American Republics, we have now deliberately set ourselves to give the most solemn expression of it all to the entire world. There have been 90 years of reaffirmation on our part of the principle of the American Hemisphere dedicated to representative government and international peace: and these generations have shown us that we are ready now for something greater and more impressive and more inspiring. Under the lofty leadership of a man, endowed not only with the serene vision of the historian intimately acquainted with the forces that have shaped our development but with a combination of well-balanced judgment and creative statesmanship, we have proposed to enter a solemn pact with all the Republics of America for the mutual guaranty of the integrity of all. Not merely territorial integrity have we thought to include, but, as well, that of institutions and that of the national spirit. The self-confidence and self-repsect of the American peoples is as important as one or another bit of their lands. We have said in effect to the world that spiritually these Republics are united, that they are devoted to the ideals of international honor and peace, that they are prepared to act together without hesitation in maintaining those ideals effectively in this hemisphere, and that they have consecrated their best efforts to the spreading and strengthening of these ideals until the entire world shall come to accept them.

The Secretary then discussed the economic and financial relations of the United States with Latin America, the abnormal conditions suddenly brought about by the "prodigious European calamity," and referred to the memorable Pan American Financial Congress which it was his "happy privilege" to call in order to consider economic questions of common interest. Speaking of the results of this gathering, Mr. McAdoo told of the creation of the International High Commission, and made the following statement concerning the first general meeting of the commission on April 3, 1916, at Buenos Aires:

With gratifying ardor the distinguished body of delegates representing 20 Republics addressed themselves to the consideration of projects presented for the improvement of our various national laws or in our several commercial and financial policies. The program was a truly formidable one, embracing 13 different subjects, many of which were large enough and complex enough to serve as the subject matter for an entire conference. Yet, in spite of that, the conference worked with such unity of purpose and brought to its task such a wealth of experience and knowledge and constructive genius that it was able to present a body of resolutions for the consideration of the various Governments that will not fail to stimulate a genuine wave of enthusiasm for the cause of progressive and enlightened commercial legislation in the American Republics. In some cases these recommendations involved the breaking of new ground; while in others a secure structure is raised upon the foundations so patiently laid in previous international gatherings on our continent. * * *

The Secretary referred to the international cooperation which characterizes the foreign policy of the United States as being the logical development of the principles and motives that guided President Monroe and his advisers in the formulation of the Monroe doctrine. On this point he further said:

We were then interested in preventing the forcible subjection of the revolted colonies and their return to a condition of political dependence. Every American must be proud of the fact that it was the privilege of his country to contribute toward the maintenance of the independence of our sister Republics. The fact that they were

able to secure this independence for themselves does not detract from the service which we were able to render to them in their hour of need.

With political independence established as a definite and final fact, the next step in the progressive development of our sister Republics is to secure a larger measure of economic and financial independence. The suffering to which many of them have been subjected by reason of the European war indicates the importance of this next step in their national development. From whatever point of view we approach the situation it is an inspiring fact that our interests are entirely in harmony with theirs. The people of the United States, deeply interested in their own economic, financial, and social progress, are anxious to see every nation of Latin America move forward in precisely the same direction. The Pan American Financial Conference of 1915 and the recent sessions of the International High Commission have demonstrated the ability and the willingness of the peoples of the American continent to assist one another in the development of their marvelous natural resources. In this great forward movement of continental progress the United States claims no position of privilege and fully realizes that the real mission of the Americas can best be fulfilled when every country is contributing its due share to the progress of the entire continent.

In conclusion, Secretary McAdoo declared that the Monroe doctrine has now become continental not merely in scope but in the support it received, and emphasized the fact in the following concluding paragraphs:

We can now well afford to discard the original name and look upon it as a policy of all the Americas, destined not merely to maintain their political independence but gradually to secure for them that measure of economic and financial self-sufficiency which is the logical and necessary accompaniment of political independence. In the attainment of these great ends we must, with each year, lay increasing emphasis on that spirit of international cooperation and mutual helpfulness which was the keynote of the Pan American Financial Conference of 1915, and which is now the watchword of American policy.

I am most anxious that you should see the full significance of this movement. It means that the Americas are sounding a new note in international policy; that they have not only begun to see but are acting upon the principle that the welfare of each depends upon the prosperity of all. It is your duty, as well as mine, to hold high and unassailable this new concept of international relations. By so doing we will be performing a service to our own country, to the American Continent, and to the civilized world.

UNITED STATES RETURN VISIT COMMITTEE TO BRAZIL.

The Return Visit Committee to Brazil, of the Pan American Financial Conference, is to leave the United States on the steamer *Vestris* on July 29. It is to arrive in Rio de Janeiro on the 15th of August, leaving that city for New York on the 12th of September by the same steamer. Among the members will be Dr. R. P. Strong, Vice President of the American International Corporation; Mr. Frederico Lage, of the firm of William Morris Imbrie & Co. of New York; Mr. Charles Lyon Chandler, South American Agent of the Southern Railway Co., Chattanooga, Tenn.; Mr. Henry C. Ulen, President of the Ulen Contracting Co., Chicago; Mr. W. C. Downs, Commercial Attaché of the United States Embassy at Rio de Janeiro; Mr. Louis R. Gray, of the firm of Arbuckle Bros.

NAVIGATION ON SOUTH AMERICAN RIVERS [1]

THE little steamer is the *Ibera;* she makes the round trip from Posados to the head of steam navigation on the Alto Paraná in eight or ten days. Somewhere back in Brazilian jungles the stream is formed, and after flowing for unknown leagues plunges over the precipice of Guayra, and thereafter becomes a navigable artery for small steamers to its junction with the Plata system at Corrientes, a distance of many miles.

The captain of the boat is an Argentine; the crew, consisting of Brazilians, Paraguayans, and Argentines, numbers about 20 persons; the passenger list is not large and many more could be carried. On the list is an Englishman, a Paraguayan yerba maté planter, a Brazilian customs officer, an Argentine photographer, an Italian lumberman returning to his forest home, several Argentine traders, and two Americans.

The first day out from Posados, uneventful, draws to a close; the little steamer seeks a placid cove and makes fast to near-by trees. The boatmen are put to work carrying wood from the forest pile to the boat, for the latter is propelled by a wood-burning engine. Even on the river boat in the forest the South American custom of late evening meals is observed; 8 o'clock is the dinner hour. The menu consists of a stew called "puchero," mutton (slaughtered aboard), excellent fish, mandioca, beans, potatoes, bread and "hard tack," Paraguayan oranges, coffee, Mendoza wine; abundance of food and sufficiently nourishing to satisfy the traveler who realizes his whereabouts.

The tropical darkness comes quickly; a few guards are placed about the boat, the captain and several passengers start the card game, the stranger wanders around and around the little deck listening to the mournful melody of the forest—truly a weird and interesting experience. Animals and insects seem to have utilized the darkness in which to come to the river to slake their thirst. The few lights aboard the steamer draw the mosquitoes and all their kindred; woe unto the traveler who has not provided double netting and a supply of "Bufach," for the latter smoulders within the cabin and drives away the pests that even manage to squeeze through the net.

At the break of day the little steamer is again on her course, crossing and recrossing the treacherous currents for which the river is noted. Thus, day by day we follow the winding course, admiring the ever-

[1] By William A. Reid, Pan American Union Staff.

SCENES ON THE ALTO PARANA.

Upper: One of the little steamers that plies between Posados and the head of navigation on this river; the wooded shore of Paraguay. Lower: The Alto Parana at Posados and a glimpse of its shipping activity.

BUSINESS ACTIVITY ON THE PARANA.

The foreground shows many Argentine quebracho logs assembled on the river front for transportation to world markets. The background depicts the class of ships engaged in the lumber trade. More capital could greatly develop this important industry.

COLONIA, URUGUAY.

This thriving little city is situated on the Plata River opposite Buenos Aires; the river here is about 30 miles wide and up and down the great watercourse pass the ships of all nations. Colonia is also connected with Montevideo by rail, a distance of 150 miles.

changing views of solitudes, and occasionally going ashore at the break in the forest where man is gradually fighting nature's growth with his diminutive sawmill or "yerbales" (plots where yerba maté is grown).

Such is the average steamboat and also a few of the many experiences that usually meet those who follow South American rivers to interior and less developed regions—experiences that bring forcibly to mind the vast and inviting possibilities of sections of the world just awakening to modern commerce.

Of the six continents South America is probably the best watered as regards the distribution of great navigable rivers and streams; at the same time nature has made certain areas so vast and barren that even the giant condor in dizzy Andean heights is sometimes found dying from thirst or lack of food.

So numerous are the rivers that have their share in bearing the products of the forest to the markets of the world or of transporting manufactured goods to interior regions that we shall have space to mention only a few of the larger water arteries—arteries in which the average tourist or man of commerce may be interested; the former in learning of what he may expect in the way of traveling facilities and possible comforts, and the latter, shipping services that are to carry his goods to markets far beyond beaten courses.

New York to Iquitos without change of ships! New York to Corumba with only two changes! How many readers not in close touch with ships and shipping can locate mentally or otherwise such places as Iquitos and Corumbá? Where are they? Both are jungle towns far away from the busy din of what we call modern life; yet these places have gradually grown to commercial importance, and corporations have found it necessary to place New York in direct communication with the former and in semidirect contact with the latter. So to-day we go aboard ship amid the pulsating activities of a great metropolis and, without change of vessels, disembark more than 2,300 miles up the Amazon River in Peru. If the mission of the traveler leads to the far-away settlement on the Paraguay, two changes of steamers after leaving New York will be necessary; at Buenos Aires and Asuncion, respectively. Corumbá lies nearly as far up the Plata system as does Iquitos up the Amazon; and if one seeks still closer acquaintance with nature and her wild fastnesses a journey to either place provides inviting opportunities.

In about 60 days the native in his canoe may float down to Para on the current of the Amazon from the primeval forest more than 2,000 miles up the river; he may then put up sail and nature will assist in taking him home, for, as in the days of Columbus, the winds still come from the east; or, to use the translated words of the great navigator:

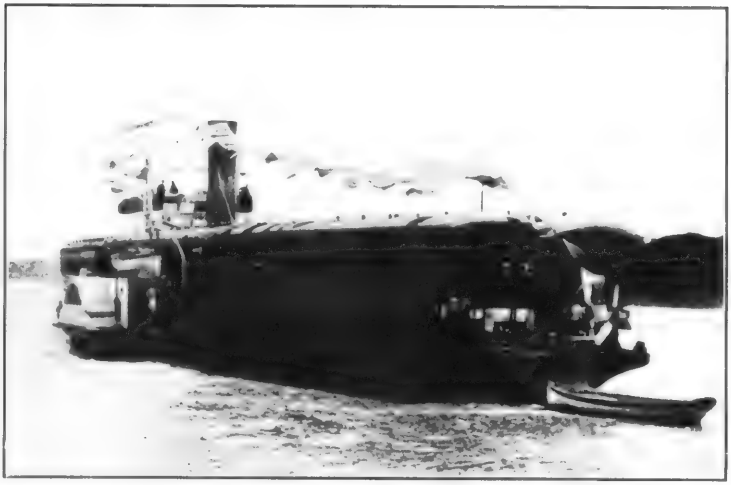
> And the winds blew strong from the east and bore us over to the west.

THE RIVER URUGUAY AT CONCORDIA, ARGENTINA.

The picture shows the breakwater, recently completed, and which now affords much better protection to shipping. Many ocean-going vessels make the port of Concordia. The city of Salto, Uruguay, lies on the opposite side of the river.

DOCKS AT ASUNCION, PARAGUAY.

The present docks and shipping facilities are inadequate, and to-day modern and enlarged port works are under construction. This port is nearly a thousand miles from the sea, on the Paraguay, and receives regularly many ocean steamships.



A CONNECTING LINK BETWEEN ARGENTINA AND PARAGUAY.

Between the Argentine port of Posados and the Paraguayan port of Encarnacion the through trains between Buenos Aires and Asuncion are ferried over the Alto Parana. The picture shows the style of ferryboat in use.

THE STEAMER "SANTAREM" NEAR IQUITOS, PERU.

Iquitos, on the Maranon, the upper reaches of the Amazon River, is the chief fluvial Peruvian port. It is in direct steamship communication with the Brazilian River ports of Manaos and Belem (Para) and also with New York and several European ports.

A hundred miles and more out at sea the mighty current of the Amazon is felt. This fact was strikingly illustrated a few years ago when a vessel on which the writer was traveling lost part of her keel off the Brazilian coast; the ship was compelled to drift; we moved northwestward in the Atlantic at the rate of four miles per hour, but upon striking the outflowing Amazon the course was soon altered, although no appreciable change in the movement of the sea was noticeable.

The three great river systems, the Amazon, the Orinoco, and the Plata are most valuable assets to inland water traffic; they drain vast areas and each system carries its waters to the same ocean but by different routes. Thousands of miles of tributaries, flowing to all points of the compass, swell the larger courses to sufficient depths for flat-bottom steamers for many future fleets of commerce.

As a practical illustration of the flat-bottom steamer and the shallow river, we have the traffic plying up and down the Magdalena from its mouth as far as La Dorada. After train service around the rapids boats again are utilized and the traveler goes many miles farther inland. Most of the steamers on the Magdalena are products of a Pittsburgh factory; and for the information of the intending traveler it may be said that these boats are small but comfortable, with electric fans and other modern conveniences. Like the one noted in the beginning of this article, they are wood burners and usually tie up at shore points during the night; coal or oil fuel not yet being available in sufficient quantities to compete with wood growing along the river banks.

It seems that nature has ordained that the streams of the west coast of the continent must be used for purposes other than steamer navigation. Some of them are called rivers, but in comparison with water arteries of the eastern section of the continent, they are, with few exceptions, mere rivulets. One of these exceptions is the Guayas, upon the shores of which Guayaquil is located. The Guayas forcibly reminds the writer of the Irrawaddy (Burma); both are alive with tropical activities. The bamboo rafts, the canoes, the balsas, the sail boats, and the little steamers are equally numerous on the two watercourses, and at a distance the boatmen themselves have many traits in common. The little balsas, with the families of the raftsmen aboard, are quite interesting. They are made of tropical wood having a cork-like floating capacity; a log 50 feet long and a foot or more in diameter will bear about two tons of freight; many logs lashed together provide a cargo carrier of considerable capacity.

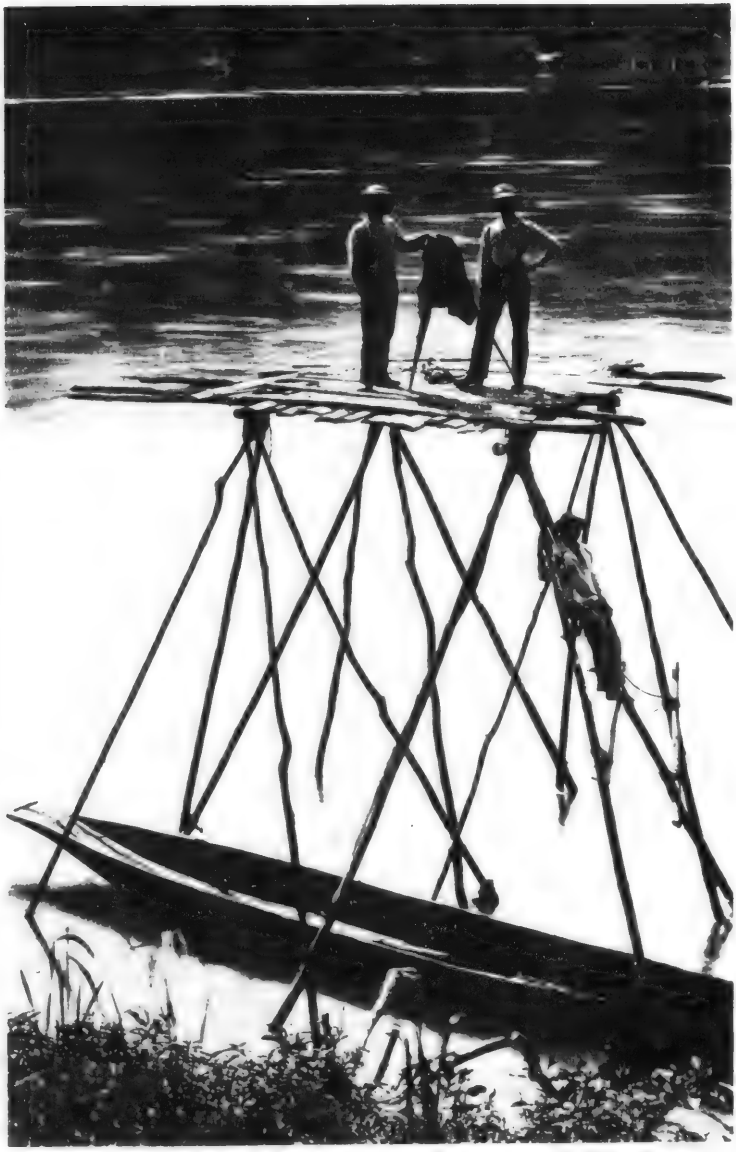
Contracts amounting to $5,000,000 and the Uruguay River are at present figuring conspicuously in the minds of several American contracting firms. The Uruguay, as will be recalled, forms the western boundary of the country of the same name. The cities of

SOME OF THE UPRIVER FLEET AT PARA.

Literally hundreds of small, light draft steamers assemble at Para from the many tributaries of the Amazon. They go thousands of miles into the interior of the continent.

A TYPICAL SOUTH AMERICAN RIVER SCENE.

Those who travel far inland on the watercourses are sure to find a scene more or less like the one here portrayed. Many of them offer excellent subjects for the brush of the artist.



PICTURE MAKING ON THE UCAYALI, PERU.

This river is so far inland that comparatively few travelers see its lonely waters. Its source is not far distant from Lake Titicaca; it flows north through eastern Peru and empties into the Maranon near Iquitos. Note the native boat hewn from the mahogany log.

Salto, Paysandu, and Mercedes have awakened to the fact that they need modern water systems, sewerage, and other public works. The first two lie immediately on the river and the third one very near, so the American companies after securing the contract acquired a ship, and this vessel is not only navigating the Atlantic ocean, but delivers the required materials hundreds of miles inland, where the contractors are now hard at work improving the Uruguayan cities.

Would the reader navigate the Amazon or its tributaries? If so he may secure passage from the Amazon Navigation Co., at Para, to Puerto Velho on the Madeira, 1,700 miles; on the Acre and the Purus, 3,000 miles; on the Negro, 420 miles; on the Oyapeck, 800 miles; and on many other streams to reach settlements that are gradually finding places on the map of civilization.

At Buenos Aires he may arrange with the Mehanovich Co., for a trip covering hundreds or thousands of miles on the Plata, the Paraguay, the Pilcomayo, the Bermejo, the Parana, and various other streams.

In order to steam up the Orinoco, the traveler takes a ship to La Guaira or to Port of Spain, Trinidad. From either place there is approximately weekly service up the Orinoco to Ciudad Bolivar; smaller boats then take one hundreds of miles on this and connecting rivers. Were it not for the rapids between Atures and Maipures, more or less, 10 miles long, it would be an easy matter to go through by steam launch from the Orinoco via the Cassiquiari into the Negro, then via the Amazon, Madeira, and Guapore to within 30 miles of a branch of the Paraguay. In other words, and according to the estimates of engineers, connection could be established between the Amazon and Plata systems by the construction of a 30-mile canal between the last two rivers named. By drawing on the imagination, based on other great artificial water links, we may in the future travel through the continent by means of little river steamers from the Orinoco to the mouth of the Plata.

The coast line of the entire South American Continent measures about 16,500 miles. Upon the navigable waters of the Amazon alone the small flat-bottom boat may traverse three times the distance around the continent. Add to these arteries the vast river mileage of the Orinoco and the Plata systems and the smaller water courses of other sections, and the fluvial possibilities of the continent become a vision that may eventually be realized.

In considering river transportation of the South American continent it naturally follows that the large inland lakes, which in several instances form connecting links of travel, should be given at least passing mention.

Courtesy of G. P. Putnam's Sons.

ON ONE OF THE SMALLER STREAMS.

This picture shows the types of boats used extensively by the managers of rubber estates and the rubber gatherers in Bolivia, Peru, and Brazil.

ON THE MAGDALENA IN COLOMBIA.

Low water on this commercial artery usually causes delay, as the steamers must pick their routes with considerable care; their progress, of course, depends largely upon the amount of cargo.

A SECTION OF THE HARBOR OF GUAYAQUIL.

The smaller craft have come down the Guayas River with all varieties of tropical products to be loaded aboard the large ocean vessels for shipment to foreign lands.

The world's highest body of water on which regular steamer service is maintained is the famous Lake Titicaca, which from the most ancient times has been associated with mystery and tradition. The traveler to-day congratulates himself if he reaches this little sea without paying the penalty nature exacts—that of suffering from siroche, or mountain sickness. Granted that one arrives in good health, there are many sights that please. The lake is 100 miles long by 35 broad. The little steamers that ply diagonally from Puno to Guaqui (125 m.) were built in Europe, transported by ship to Mollendo, and then carried in sections by rail up the mountains, and finally assembled on the shore of Titicaca. The crossing of the lake in 10 or 12 hours is interesting; at times one gets glimpses of the islands of the Sun and the Moon, whence tradition says the Inca race originated. Snow-capped mountains dominate the shoreline, the rarified air burns the face to a rosy red, for the little vessel rolls in the waves about 3 miles above the level of the sea. Cloud effects are marvels of beauty and nowhere has the writer seen more awe-inspiring displays of electrical phenomena.

In normal times by-weekly services are maintained between the Peruvian port of Puno and the Bolivian port of Guaqui by the corporation operating most of the Peruvian railways. Various other smaller settlements are located here and there around the lake, but they are served by steam launches or the curious grass-made boats of the native inhabitants.

Two thousand miles farther southward, where the Andes are much lower, is another beautiful lake near the boundary of Argentina and Chile. This is Nahuel Huapi, and the surrounding region is soon to become a great Government park with Huapi as one of the stellar attractions, just as Yellowstone Lake and its boiling geysers please the visitor in the American park of the same name.

In recent years travel between Argentina and Chile has gradually increased and the little steamers plying across the lake from Bariloche are a convenience for both freight and passengers, especially used during the months of July, August, and September when the trans-Andean railway is often blocked by snow.

How do freight and passenger rates compare with those prevailing on great rivers of other countries? These are questions of a most practical nature and are frequently asked. On either class of traffic booklets could be written and still the subject would not be covered in its many details. But to be brief, freight and passenger rates on South American rivers are usually high, often exorbitant, and subject to frequent changes, depending of course, on the article to be shipped and the particular river. For instance, to transport crude Bolivian rubber from a point on the Madeira River to Para the cost often averages about $18 per 100 pounds. All other freight

WATER FRONT OF VALDIVIA, CHILE.

Valdivia is one of the important cities of southern Chile. It occupies a picturesque site not far from the mouth of the Calle-Calle River. This city was the fifth founded by Pedro de Valdivia, who gave it his own name, in 1552. It was the scene of fierce battles between the Spaniards and the Araucanos and later, during the war of independence, one of the most notable encounters took place in Valdivia Bay, when Lord Cochrane's fleet defeated the Spaniards in 1820. At present it has a population of over 20,000. The commercial section of the city, which was destroyed by fire some years ago, has been practically rebuilt of concrete, over $700,000 having been expended on this type of construction.

THE CITY OF CONCEPCION AND THE BRIDGE OVER THE RIVER BIO-BIO, IN CHILE.

Concepcion is picturesquely situated on the Bio-Bio River, across which passes a bridge measuring 1,738 meters (5,700 feet) in length. The city of Talcahuano is a few miles distant, on a bay of the Pacific Ocean. Both are directly connected with Santiago by rail and thus can be said to be on the Longitudinal Railway.

is proportionately expensive. Passenger rates from New York to Iquitos and return average about $400; time one way is slightly over a month. Local first class fare from Para to Manaos, 1,000 miles, is $26. From Barranquilla up the Magdalena the traveler pays $50 for 540 miles of steamer service, changing at La Dorada, Girardot, etc., if bound to Bogota. One may go from New York to Corumbá for about $280, the different sections of the trip costing: New York to Buenos Aires, $200; Buenos Aires to Asuncion, $50; Asuncion to Corumbá, $30; time, slightly over a month, depending upon connection at Asuncion.

The writer of romances finds an ideal field on South American streams. One gifted author went forth to the Plata, expecting in three months to write its romance; three years passed and the story is just finished—the result is two large volumes. Five hundred discouraged and heart-sick men started to walk and raft themselves back to civilization from the Madeira; to-day a human skull found here and there along their route tells the grim story. Near the headwaters of the Amazon a young European explorer was found, nearer death than life. He had sought surcease from sorrow for his lost love. The Orinoco, the Paraguay, the Negro, the San Francisco, the Heath, the short and fabled Desaguadero, and scores of others have their own stories of romantic and heroic achievement, of tradition, of hardships, of suffering. Some day these stories will be related.

What an extensive field still awaits the explorer, the scientific investigator, the huntsman, along South American rivers! Many daring men have told us a few of the secrets of the primeval forest, the almost impenetrable jungle, the high mountains; but considering the expanse and unmeasured areas, and the few new leagues of country that yearly become better known to the enlightened world, the opportunities for further study are indeed unlimited. Sailing up some of the oft-traveled streams we are constantly reminded of how meager is intimate knowledge of the great forest. Here a big tributary enters, but whence it originates or what lies along its course no man can say; fifty miles, a hundred miles farther, other streams pour fourth their placid waters, but along their overhanging shores perhaps no man has ever trod.

MAIZE--THE GREATEST OF AMERICAN FOOD PRODUCTS[1]

THAT man is and has been for many ages of his development an omnivorous animal is evidenced by his teeth. His incisors and canine teeth are still with him, still serve the purpose of biting off and tearing the flesh he consumes, while his molars serve the purpose of grinding the grain he eats in many varied forms. True, he no longer tears raw flesh from the bone with the former, nor does he grind raw grain with the latter, but fundamentally his diet is very much the same now that it was some 100,000 or more years ago. Being now as he was then, both carnivorous and granivorous, and having been so all through the slow ages that have passed since he first became human, his teeth haven't changed much, nor has his appetite for that matter. The discovery that the application of fire to his food improved it very materially in several respects, a discovery that resulted in that most important of all arts, cookery, may have modified his tastes somewhat, but he still needs the same nutritive elements regardless of the fact that he partakes of them in a more elegant and dainty fashion and with somewhat more formality than was his custom when his palace was a cave and his weapon a club.

Rub off the thin—mostly very thin—veneer of civilization and place him in the primitive environment of his remote ancestors the average man will prove to be about the same animal. His elemental nature has undergone but little change. Doubtless, his brain has been greatly developed and his mental machinery much improved, but his complicated physical structure is but little altered. To keep that physical structure in good repair and to keep the entire human machine in a high state of efficiency, man has found that he needs a variety of food. As a consequence he has from time to time discovered new things that are "good to eat," things that contain the chemical elements in one form or another that he needs to replace the tissues of nerve, muscle, bone, and fat—the brain and brawn—that are wasted during his day of activity. Meat contains some of these elements, as do nuts and fruits, but the greatest foods, those upon which the greatest number of men depend, are the grains; and the greatest of all the grains, the one most recently made known to

[1] By Edward Albes, of Pan American Union staff.

Photo by Underwood & Underwood, New York.

A CORN FIELD IN IOWA.

The two greatest corn-producing States of the United States are Iowa and Illinois. In 1914 there were 10,248,000 acres of land planted to corn in Iowa, resulting in the production of 389,424,000 bushels of the product, while in Illinois the acreage was 10,346,000 and the production 300,034,000 bushels. In 1915, however, Illinois led with an estimated production of 376,164,000 bushels, Iowa's estimated production being 303,000,000 bushels the acreage being 10,449,000 and 10,100,000 respectively. The above picture shows an Iowa corn field in an early stage of its cultivation.

Courtesy of States Relations Service, United States Department of Agriculture

A PROPERLY CULTIVATED CORN FIELD.

One of the special bureaus of the United States Department of Agriculture is known as the States Relations Service. This bureau has charge of what is called the "farmers' demonstration work" throughout the country. Its hundreds of agents, who are experts in their respective lines of agriculture, devote their time to teaching and demonstrating the best methods for improving the soil and cultivating the various staple farm products, thus showing the farmers how to obtain the best results from their land. The above picture shows a field of corn in the mountain section of Cullman County, State of Alabama, planted and cultivated under the direction of one of the United States demonstrators. It produced 100 bushels of corn to the acre, while the crop on similar land in the vicinity under ordinary cultivation produced about 20 bushels to the acre. According to the report of the demonstrator, the soil—a sandy loam—was plowed and subsoiled March 11; the corn was planted May 11 in rows 4 feet 4 inches apart, with plants 10 inches apart in drills. It was subsequently cultivated shallow six times. The result demonstrated the possibilities of comparatively poor land when properly treated.

SCIENTIFIC AGRICULTURE VERSUS ORDINARY FARMING.

It has been found that a deep and thorough stirring up of the soil, aided by the use of a proper fertilizer, stimulates the productivity of the land. Recent experiments in the use of dynamite to break up the land have met with great success, as may be seen from the above picture. The land on the left was dynamited and the corn properly cultivated, producing the splendid crop shown, while that on the right was given merely ordinary cultivation and plowing.

what we are pleased to call the "civilized" world, is the one given to it by the Americas, viz, Indian corn, better known beyond the confines of the United States by the name of "maize," the spelling of the word varying somewhat in the several languages into which it has been incorporated.

That maize was unknown to European, Asiatic, and African peoples before the discovery of America is now well established. Aside from the testimony of Humboldt, Darwin, and others, the matter of the origin of maize was finally settled by the celebrated Swiss botanist, Alphonse De Condolle, who in the revised 1882 edition of his "Origin of Cultivated Plants" sifted all the evidence and reiterated the statement he made in 1855 that "Maize is of American origin, and has only been introduced into the Old World since the discovery of the New."

Just where in the Americas it originated is a mooted question. "At the time of the discovery of the new continent," writes De Condolle, "maize was one of the staples of its agriculture, from the La Plata Valley to the United States. It had names in all the languages. The natives planted it around their temporary dwellings where they did not form a fixed population. The burial mounds of the natives of North America who preceded those of our day, the tombs of the Incas—the catacombs of Peru—contain ears or grains of maize, just as the monuments of ancient Egypt contain grains of barley and wheat and millet seed. In Mexico a goddess who bore a name derived from that of maize (*Cinteutl*, from *Cintli*) answered to the Ceres of the Greeks, for the first fruits of the maize harvest were offered to her, as the first fruits of our cereals to the Greek goddess. At Cuzco the virgins of the sun offered sacrifices of bread made from Indian corn. Nothing is better calculated to show the antiquity and generality of the cultivation of a plant than this intimate connection with the religious rites of the ancient inhabitants." Again he says: "The cultivation of maize is more ancient than the monuments, to judge from the numerous varieties of the species found in them, and their dispersal into remote regions."

That maize was a staple crop among the ancient Peruvians and that they made both food and drink from it, may be gathered from many sources. In this connection a passage from the "Royal Commentaries of Peru," written by Garcilasso de la Vega, the great Peruvian historian, whose mother was a daughter of the ancient line of Inca monarchs and whose father was one of the old Spanish conquistadores, is of more than passing interest. It is taken verbatim from an old translation of the Commentaries, made by Sir Paul Rycaut and published in 1688, and runs as follows:

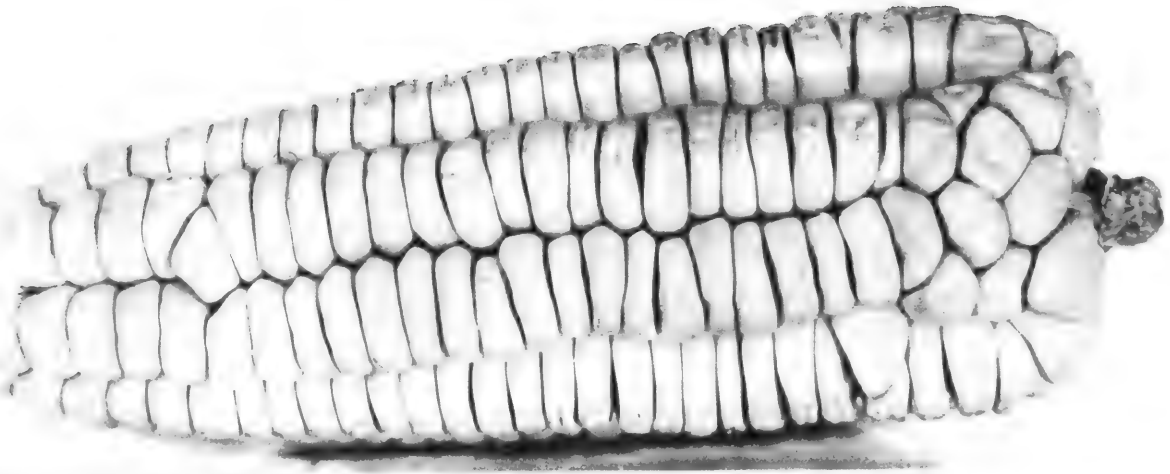
The Fruits of *Peru*, by which the *Indians* were sustained before the coming in of the *Spaniards*, were of divers sorts, some being produced above, and others under the

ground. Of the Fruits which grow above ground, the chief and principle is that Grane which the people of *Mexico* and *Barloventa* call Mayz, and those of Peru, Cara, being the onely Bread they use: And this is of two sorts; one is hard, which they call *Muruchu;* and the other tender and fine, called *Capia:* they eat it for Bread, either baked or parched over the fire, or boiled in water: the hard Mayz is that which they have brought to show in *Spain*, but not the fine and tender sort. Some parts produce much finer, and tenderer than others, particularly the Countrey of *Rucana*. At their solemn sacrifices, as we have said, they used Bread made of Mayz, which they called *Cancu;* and at other times, on occasion of a Feast or treatment which they gave, they made that sort of Bread which was called *Huminta;* the which sorts of Bread had little difference in themselves, being onely distinguished by their use, some being made for sacrifice, and others for common sustenance: Their Corn was Ground by the Women on a broad Stone, on which they cast the Grist, and on the top thereof they laid another stone in the fashion of a Half Moon, not round, but with a point of three fingers broad at each corner. At the corners of the Stone, made Half Moon wise, they laid their hands, rubbing and pressing it hard on the Mayz, until it was broken: This difficulty and trouble they had in grinding their Mayz, and all other Grane; for which reason they did not commonly eat Bread. They did never beat their Corn in Mortars, though they had learned the way of it: because it required more labor of the Armes, than the Grinding with a Stone, the weight of which made the work more easie: * * * They made also a kind of Hasty-Pudding, called *Api*, which was a great dish amongst them, and which they eat with much delight; but this was esteemed high feeding, and not common at every meal. The Flour they divided from the Bran, in this manner, they laid all upon a clean cloth made of Cotton, and then spread it with their hands all over the Cotton-cloth; the finest part of the Flour would stick to the Cotton, but the more gross parts of the Bran would remain loose from it, and so they easily took it up, and divided it with their hands; they then swept up the Flour which stuck to the cloth into the middle; and having taken that away, they brought more, until they had cerned and sifted all their Grist; but they chiefly took this pains for the sake of the *Spaniards*, and not of the *Indians*, who were not so curious in their diet, but that the coursest sort of this Bran would go down with them; for the Bran of Mayz is not so harsh or choaky, as much to offend the palate. This was their manner of dividing the Bran from the Flour, for as yet the use of Sieves was not brought from *Spain*, by reason that their Bread was all made of this Mayz, and not of Wheat: All which I can testifie to have seen with my own eyes, having been nourished for nine or ten years with no other Bread than of *Cara*, which is Mayz; the which is of three sorts: *Cancu* is for sacrifice, *Huminta* for their Feasts, and great entertainments; Tanta, with an aspiration on the top of the mouth, is common Bread. *Cara*, when it is parched, they call *Cancha*. * * * Of the Flour of Mayz the *Spanish* Women made Biskits and Fritters, and other Dishes, both for healthful, and people that were sick; for the Physicians in that Countrey forbid Wheaten Bread to all those that are sick, and prescribe them no other diet, than what is made of Mayz. Of this Flour, with water, they brew their Drink, which the *Indians* know how to make sower after a certain manner, that it becomes excellent Vinegar. Of the Canes before the Mayz is ripe, they make rare Honey; and after it is ripe, the Canes being dried, are good feeding for all Cattel. Some *Indians*, who love to be drunk, lay *Cara* steeping in water, until it be grown, and then they grind it, and boil it in the same water, and afterwards draw it off, and keep it until it be stale: This is the strongest drink they have, and which presently makes them drunk, they call it *Vinnapu*, and in other languages *Sora*. The *Incas* forbad it, because it was so violent and strong, though now, they say, it is come in use again amongst some toping fellows. All these uses, as we have said, they have of this *Cara*, besides many others in Medicines and Physick, and in Plasters, as we have mentioned in the other part.

Courtesy of the States Relation Service, United States Department of Agriculture.

BOYS' CORN CLUBS IN THE UNITED STATES.

One of the activities of the States' Relation Service of the United States Department of Agriculture is the organization of corn clubs among the farmers' boys throughout the country. Teachers in the rural schools organize the school boys over 10 years of age into clubs; the demonstration agent of the Government furnishes the plan of organization and the instructions; the respective parents furnish the required land, teams, and implements; the merchants and bankers of the community provide prizes; and the local newspapers give publicity to the work. Each boy must prepare the soil, plant, and cultivate 1 acre under regulations governing all contestants. The result of 300 to 400 boys entering such a contest in a county arouses great interest, and the boys learn the best way to raise corn. In one State a small boy raised 152¾ bushels on his acre of land, while the average yield for the State was but 16 bushels to the acre. The upper picture shows one of these corn clubs receiving instruction; in the lower may be seen one of the young prize-winning farmers standing in his field.



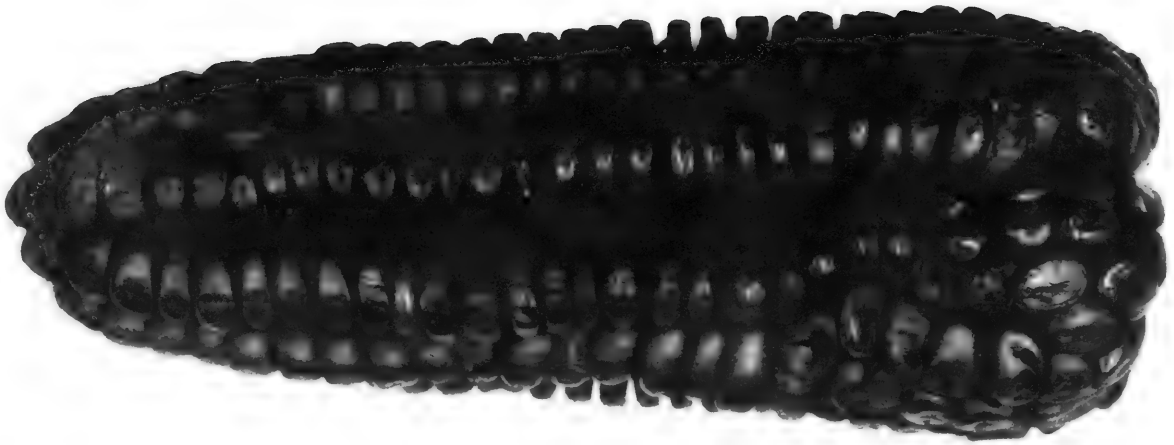
Courtesy of the Bureau of Plant Industry, United States Department of Agriculture.

TYPICAL EAR OF CUZCO CORN.

Note the size of grains, and that there are but eight rows on the cob. The variety is indigenous to the tropical countries of South America, and is extensively cultivated in Bolivia and Peru, sometimes at an altitude of 12,000 or more feet above the sea level. This is one of a number of varieties that had been cultivated by the aborigines for many centuries before the Spanish conquest. Several varieties have been found in the ancient tombs of the Incas, a circumstance which points to the great antiquity of maize culture among the Peruvian Indians.

It will be seen by the foregoing that long before the advent of the white man the Peruvian Indians made corn bread as well as corn whisky and that the Incas had instituted a system of prohibition among their subjects. Verily, there's but little that's "new under the sun."

It was not only in Peru and Mexico, however, that maize was extensively cultivated. In reality it was the great food plant of practically all the American Indians who sought the aid of cultivation in obtaining food. The name is supposed to have been derived from the Arawak *marise*, corrupted to *maysi* and *mahiz* by the Carib natives of the Antilles. Columbus found it to be the principal food staple of the natives of Santo Domingo or Haiti, where it was called *mahiz*, and his was the first account of the grain made public in Europe. According to the Handbook of American Indians (Bulletin 30), published by the Bureau of American Ethnology, Smithsonian Institution, Washington, D. C., maize is generally supposed to have been derived from native grasses, the *Euchlæna mexicana* of south Mexico and *E. luxurians* of Guatemala, the latter approximating most nearly the cultivated corn. Harshberger says linguistic evidence shows that maize was introduced into the United States from the tribes of Mexico and from the Caribs of the West Indies, but the time of this introduction can only be conjectured. That it was long before the appearance of Europeans, however, is evident, not only from its early and widespread cultivation by tribes of the area now embraced in the United States, but from the fact that indications of its cultivation are found in mounds and in the ancient pueblo ruins and cliff dwellings, while corroborative evidence is found in the fact that several varieties of maize had already been developed at the time of the discovery, four being mentioned as in use among the Indians of Virginia. Jacques Cartier, the first European to enter the St. Lawrence, observed large fields of growing maize at Hochelaga (now Montreal) in 1534, and Champlain found it in cultivation at almost every point visited from Nova Scotia to upper Ottawa River. The supplies obtained from the Indians by the New England and Virginia colonists are well known. Hennepin, Marquette, Joliete, La Salle, and other early French explorers of the Mississippi Valley found all the tribes they visited, from the Minnesota River to the Gulf of Mexico, and even into Texas, cultivating maize; and the same was true of the tribes between northwest Mexico and the plains of Kansas when visited by Coronado in 1540–1542. Even the Mandan and Arikara on the upper Missouri had their maize patches when first seen by the whites. In short, it "was cultivated both north and south to the geographical extent of its productive culture," according to Brinton's American Race, and many of its present forms as a food are derived from the Indians, such as ash cake, hoecake, succotash, samp, hominy, etc.



Courtesy of Bureau of Plant Industry, United States Department of Agriculture.

AN EAR OF RED CUZCO CORN.

At the time of the Spanish conquest of Peru the natives had produced not only ordinary varieties of white and yellow corn, but also varieties of various shades of red and of purple coloring. The grains of the ear pictured above are of a very dark-red color. It is only the pericarp of the grain which is thus colored, the starchy substance of the inner part being as white as that of ordinary corn. Ears having purple grains are also quite common.

According to Fee (Souvenirs de la Guerre d'Espagne), it was in 1500 that the first maize was sent from America to Seville, Spain, for cultivation. From Spain it was introduced into France, Italy, Turkey, and other eastern sections of Europe, as well as into northern Africa, whence it soon spread to other parts of that continent. Its introduction into Asia was doubtless due to the Portuguese voyagers who took it to India, China, Cochin, and parts of the East Indies soon after the establishment of their settlements by Vasco de Gama. Some of it was also doubtless introduced by way of the route from Turkey. Once introduced, and its valuable properties as a food for man and beast established, its cultivation spread with wonderful rapidity, so that it has now become the greatest grain crop, from the standpoint of quantity as well as value, in the world. According to J. Burtt-Davy (Maize—Its History, Cultivation, Handling, and Uses, 1914), the figures for the comparative world's crop of the leading cereals for a single year are as follows:

	Bushels.
Maize	3,875,927,000
Oats	3,532,470,000
Wheat	3,428,998,000
Rice	3,203,782,000
Rye	1,432,395,000
Barley	1,293,916,000

According to the 1915 Yearbook of the United States Department of Agriculture, in 1914 the world's maize crop amounted to 3,864,279,000 bushels, the United States furnishing 2,672,804,000 bushels thereof. In that year the wheat production was but slightly less, the world's crop amounting to 3,619,466,000 bushels. In 1915, however, the maize production of the United States came to the unprecedented figure of no less than 3,054,535,000 bushels, having a farm value of over $1,755,860,000. Just what the figures of the world's crop were can not now be ascertained, owing to the lack of official statistics from Russia, India, Australia, and some other countries. From reports that are available, however, it may be safely estimated that the total production was considerably in excess of 4,200,000,000 bushels.

Of the entire maize crop of the world the United States produces about three-fourths. Corn is such a commonplace, ordinary sort of thing, and so uninteresting to most city-bred people, that perhaps few of them realize the important rôle it plays in the economic well-being of their country. Unless their attention had been directly called to the fact, not many of them would even guess that the corn crop of the United States is worth nearly twice that of the wheat crop, or that in 1915 the record-breaking wheat crop of 1,011,505,000 bushels, worth $930,302,000, and the big cotton crop, worth $602,393,000,

when added together still lacked $223,165,000 of being as valuable as the humble corn crop.

In regard to the production of maize in countries of the Americas other than the United States, statistics are available in but few instances. This fact may be largely due to the circumstance that in nearly all of them it is raised for home consumption only. It is grown extensively in all the countries of Central America, the West Indies, and in the tropical regions of South America, but accurate statistics as to their production are not available with the exception of the following countries: Argentina, the greatest of the corn-producing South American countries, in 1915 produced about 338,235,000 bushels; Mexico produced about 60,000,000 bushels; Uruguay produced 11,495,000 bushels; and Chile about 2,000,000 bushels. Argentina exports something over 70 per cent of its annual production, and consequently is an important factor in the world's commerce in the commodity. In fact, that Republic is the greatest corn-exporting country in the world and the market price of the staple in Europe largely depends upon the success or failure of the Argentine crop. The United States, as heretofore stated, produces about three-fourths of the world's crop, but sells less than 2 per cent of its production to foreign consumers. Incidentally it may be noted that Argentina is at present utilizing not over one-eighth of the land that is splendidly adapted to the production of maize. Multiplying its present production by 8, it may be seen that within a few years its annual production will rival that of the United States. Improved methods of cultivation, of storing, and of transporting the grain will also increase the country's exporting power, and it is a tolerably safe prediction to state that 30 years hence Argentina will absolutely dominate the world's corn market. In 1912 the country's maize exports amounted to 5,480,817 metric tons (about 219,000,000 bushels). With the country's production developed to its maximum, its annual export should reach over 1,500,000,000 bushels. The annual increase of the country's wealth from its corn crop alone is destined to be enormous, and the Argentine farmer is shrewd enough to give his attention to the crop that pays the most on his investment of capital and labor.

Botanically, maize belongs to the group of monocoteledons and the family gramineæ, or grasses. It has never been found in a truly wild state, but its closest relative, as heretofore suggested, is the native grass, *Euchlæna*, of Mexico. Linnæus gave it the botanical name *Zea mays*, the generic term *Zea* being from the Greek word—the name of a grain mentioned by Homer as being used for feeding horses—while the specific term *mays* is the original American name under which it was introduced into Europe. The maize plant is so well known throughout the Americas that no detailed description is necessary. In general terms it may be said to be a tall, monoecious

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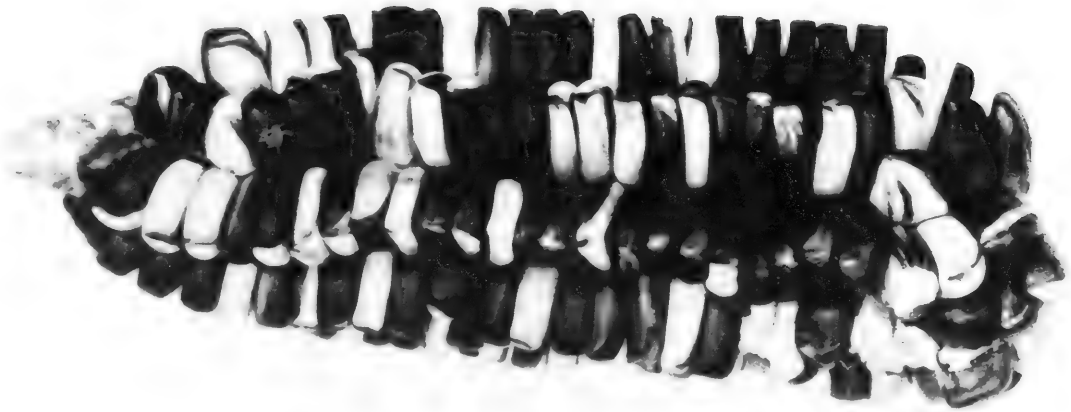


Courtesy of Bureau of Plant Industry, United States Department of Agriculture.

MINGLED RED AND WHITE GRAINS ON AN EAR OF CUZCO CORN.

Ears of the corn are often found which have red and white (or yellow) grains intermingled in about equal proportions on the same ear. It is said that ears with grains of many colors were regarded as sacred by the ancient Peruvians, and that on the occasion of their annual harvest festivals, celebrated with music, dancing, feasting, and drinking *chica* (a liquor made from the grain of maize), prizes were distributed among those who were lucky enough to find certain colors in the grains of full ears. Choice ears of corn and quantities of *chica* were offered as propitiatory sacrifices to the gods in connection with prayers for a plentiful harvest; bread made of corn meal of special excellence was offered to the virgins of the Temple of the Sun, and also formed one of the dishes for festival occasions; before crossing a dangerous stream, or before fishing in a river, grains of corn were thrown into it to propitiate its god.

grass with stout, erect, solid stem and long, rather broad, ribbon-like leaves; the staminate flowers form a terminal panicle; the pistillate flowers are arranged in a densely crowded spike called the "ear," terminating a short lateral branch and closely enveloped in leaf sheaths called the "husk;" the long styles, exserted in anthesis, form the "silk" or beard.

To go into the matter of its culture, the climatic and soil conditions required, the many varieties and hundreds of breeds produced by scientific agriculturists, the diseases and pests to which it is subject, and the many other details of interest chiefly to the specialist in maize culture is beyond the scope of this article. Readers specially interested in such details know that corn culture has been the subject of many voluminous works in the form of books as well as special reports of agricultural departments of various governments in whose countries it is a staple product, and know that such works are available in almost any public library. For the casual reader it will perhaps be enough to state that maize seems to be peculiarly sensitive to climatic variations, and these furnish the principal limiting factor of distribution of the crop. These variations include temperature, sunshine, amount and incidence of rainfall, and length of growing season. Geographic features and the character of the soil are also important. Only when these several factors are suitably combined is maize culture commercially successful. Broadly speaking, the most favorable conditions are long, humid summers, hot days and warm nights, comparatively heavy, intermittent rains, with abundance of clear, sunshiny weather between. Altitude is a very important factor, since it materially influences length of season, temperature, precipitation of moisture, depth and richness of soil, etc., and must thus be taken into account. Humboldt records vast maize fields on the Mexican plateau at 8,680 feet above sea level, and near Lake Titicaca in Peru and Bolivia maize is successfully grown at an elevation of over 12,000 feet. In the United States, on the other hand, the great corn belt between the thirty-fifth and forty-fifth parallels has an altitude ranging from 500 to 1,500 feet. Being a tropical plant, maize is susceptible to frost in all its stages of growth, but being an annual it can be grown as a summer grain crop in temperate climates and as a fodder crop, but not for grain, even in cool-temperate areas, such as the south of England. Nearly 90 per cent of the United States crop is grown where the July isotherms average from 70° to 80° F., while the Argentine crop is grown with a mean January (midsummer) temperature of 75° F.

Having noted the tremendous production of maize and its broad distribution throughout the world, the question naturally arises, What is it all used for? Briefly, its principal uses are (1) for human food, when ground into meal and otherwise prepared; (2) as a source

Courtesy of the United States Department of Agriculture.

BREAKING LAND FOR CORN IN PROVINCE OF SANTA FE, ARGENTINA.

Argentina being in the Southern Hemisphere, the seasons are the reverse of those of the United States. In the central part of the corn belt the planting begins about September 15 and continues until January 1, the principal part of the planting being done between October 1 and December 15. The long period of time during which corn may be planted is very advantageous to the corn planters. Many make a practice of planting at least a part of the crop early, so that replanting may be done a month or two later, if necessary. The corn is planted largely by listers and by common planters, most of which are imported from the United States. The corn is planted in rows, from 25 to 30 inches apart, the hills in the rows being from 12 to 24 inches apart. The time required for the corn to mature varies with different varieties, but generally from 135 to 160 days must be allowed

Courtesy of the United States Department of Agriculture.

SHUCKING CORN IN ARGENTINA.

The harvesting season is at its height in April and May. Corn in Argentina is shucked from the standing stalks in the field and thrown into baskets, which the shuckers move from place to place as the work progresses. Each basket, when filled, is carried to some convenient point, where the corn is emptied into sacks. A number of these sacks are placed together in the field and are later loaded on a wagon and hauled to the "troje" or crib.

of alcoholic beverages; (3) for stock food, either whole, crushed, or ground; (4) in the arts and manufactures, for which the inferior grain, the husks, cobs, and stalks are extensively used. Also, in the course of preparation for human food and for manufactures, a number of by-products are obtained which are used for stock and cattle feeding.

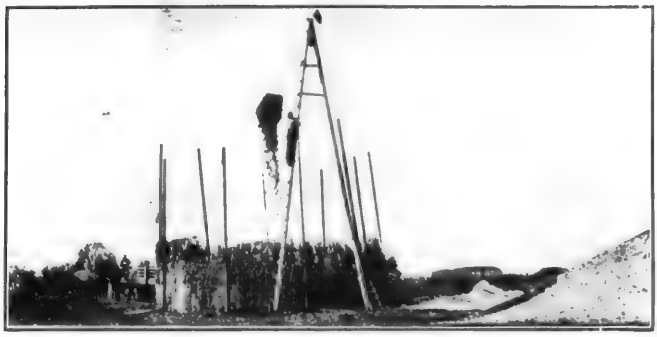
The food value of maize is shown by a chemical analysis of an average grain which, when dry, is as follows:

	Per cent.
Protein	12.85
Carbohydrates, or nitrogen-free extract (starches, sugars, etc.)	80.12
Ether extracts (fats)	5.36
Ash	1.67
	100.00

To make its chemical constituents available for human food the grain is prepared in several ways. Among the native tribes of the Americas the general method was to crush and grind the grain between two stones, the one hollowed and stationary on the ground and the other rounded and held in the hand, the bran being separated from the meal by hand. This meal was then used to make bread, cakes, etc., much as it is used by the white man to-day. According to Prescott, the Aztecs were addicted to "confections and pastry, for which the maize flour and sugar supplied ample materials," and he adds, furthermore, "The Aztecs were as curious in its preparation, and as well instructed in its manifold uses, as the most expert New England housewife."

In the United States, the maize-producing country par excellence, it has been an important food factor from the earliest colonial period to the present. The first settlers subsisted mainly on maize after the Indians had taught them its culture and use. Improved methods of cultivation and new inventions in milling processes have but multiplied the forms of its use, forms that have become so numerous and varied that a complete enumeration thereof is not feasible in this sketch. Nor is that use restricted to any one section of the country, for in one form or another maize forms an important part of the diet of the people in all parts of the big Republic and among all classes. Only a few of the common forms in which it is used may be set out, as follows:

The grain when cracked into smaller bits and separated from the hulls and germs by specially constructed mills is made into a product called "hominy," which consists chiefly of the horny, starchy part of the kernel, with more or less of the white starch adhering. This product is boiled (often with salt meat) as a vegetable, and used as a substitute for rice or potatoes. Again, the horny portion of the grain is coarsely ground, and it is than known as "grits," or "hom-



Courtesy of the United States Department of Agriculture.

ARGENTINE "TROJES" OR CORN CRIBS.

The "trojes" are built by placing poles in the ground in the form of a circle. Wires are then strung around on the inside of the poles to hold the corn or cane stalks of which the walls are constructed, as the filling of the troje progresses. These stalks are usually not fastened to the wires, but are held in place by the corn. The corn in the sacks as hauled from the field is emptied into a box placed alongside of the wagon. This box, filled with corn, is then drawn up over the top of the troje on a wire cable, where it is dumped into the inclosure. Sometimes the trojes are covered with canvas or zinc sheeting, but usually the covering is of cornstalks and husks or similar material. The top picture shows a troje in process of construction, while the lower shows the completed structures.

iny grits," and when boiled is eaten with milk and sugar as a porridge, or made into puddings, scones, fritters, etc. The finely ground form of the grain is known as "corn meal," and is cooked and eaten in the form of porridge known as "corn-meal mush" in the United States; the meal is also used to make puddings, cakes, fritters, etc., and in the Southern States especially to make "corn pone," "hoe cakes," and a light, friable, wholesome bread generally called "corn bread" and sometimes "Johnny cake." Incidentally it may be noted that in Italy, when cheese or other protein food is added to the corn-meal mush it is known as "polenta," and that the favorite food of Mexico, "tortillas," are cakes made of corn meal.

In the New England States corn meal is mixed with wheat and rye flour to make the famous "Boston brown bread." The starchy portion of the grain when very finely ground and pulverized is known as "corn starch," or "corn flour," from which are made blancmanges, puddings, and various easily digested foods and desserts. In this form it is also often an ingredient in ice cream, giving it a smooth and velvety taste.

One peculiar variety of maize is known as "pop corn." It is so called because the grains when heated or roasted "pop" or burst open, so that they are turned completely inside out, the bursting being caused by the expansion of the moisture content and the swelling of the starch by the application of heat. The grains thus treated are then covered with sugar or sirup and formed into balls or packages of convenient size, and thus become a favorite sweetmeat for children and many adults.

Another form of preparation of the grain for food purposes which has become very popular in the United States during recent years is variously known as "corn flakes," "corn crisps," etc. The product is prepared from grain from which the germ and hull has been removed and which has been treated with sugar and salt. The prepared grain is cooked by steam, dried, rolled, and toasted in the form of thin flakes in a special oven, and is put up in packages and sold under various names as a choice breakfast food, usually eaten with milk or cream and sugar, and easily digested.

One of the most universal uses as a food to which maize is put in the United States, however, is as a "green" vegetable. The young grains of a maize "ear," before they harden and while much of the starch is still in its liquid or milky state, when boiled or roasted form a delicious food. Varieties known as "sugar corn" are usually considered the best for this purpose, the grains having a sweeter taste and being softer than the other kinds. Eating corn in this form became so popular that a method for preserving the grains in jars and tins was devised in order that it might be available the year round. This canned product has become so popular that millions of dollars

Courtesy of the United States Department of Agriculture.

GRAIN ELEVATORS IN ARGENTINA.

Of the surplus corn-producing countries of the world Argentina occupies first place, furnishing about 55 per cent of the total international trade. To store the immense corn and wheat crops of the country preparatory to shipment to other countries requires enormous storage room. In the top picture may be seen a few of the great elevators on the water front in Buenos Aires. The picture in the center shows one of the modern country grain elevators recently built in the interior; the bottom picture is that of an elevator at Rosario, showing laborers in the foreground stirring damp grain by walking through it.

are now invested in the canning industry in the United States. The grains while freshly gathered are cut from the cobs, steamed sufficiently for preserving purposes, and then put in hermetically sealed tin cans. Used in soups or cooked in various ways, the canned product is almost as popular as is that fresh from the fields.

As a source of alcoholic beverages tremendous quantities of maize are used. The large quantity of starch present in the grain renders it particularly suitable for this purpose. The process of manufacture may be briefly outlined as follows: After cleaning and crushing the grain, the hull and embryo are removed. The remainder is then ground and cooked to dissolve the starch. The starch is fermented with 10 per cent of barley malt and yeast, and about 40 gallons of water per bushel of grain. The enzymes of the malt change the starch into sugar, and the yeast plants, feeding upon the latter, deposit alcohol as a waste product. The alcohol is evaporated off from the remaining water, etc., and is then condensed by passing through cold coils. The residue left in the fermenting tanks is washed to remove the remaining alcohol and pressed to take out as much as possible of the liquid. The latter is known as "distillery slop," while the solid portion is called "distiller's grains," and both products are used for stock feed. In the United States the manufacture of "Bourbon" and straight "corn" whisky consumes something over 30,000,000 bushels of maize annually, while in Great Britain about an equal quantity is used in making whisky and gin. How much is thus consumed throughout the world there is no way of determining, although the quantity must be enormous.

Lack of space prevents adequate consideration of maize as a stock food. The fattening and meat-producing qualities of maize are well known, and not only the grain but the leaves, stalks, and even the cobs are ground and used for this purpose. In the arts and for manufacturing purposes maize furnishes valuable raw materials. Out of grain of low grade, out of the stalks, and from the cobs are made such materials as starch, dextrine, glucose, corn oil, glycerine, sugar, alcohol, cellulose, rubber filler, paper, mats, hats, tobacco pipes, charcoal, powder, and various medicines.

In conclusion, the value of maize as a human food is underestimated in some parts of the world, notably in certain European countries, where it is regarded as merely a stock food. Many experts who have studied the subject now contend that maize is the cheapest and almost, if not quite, the best cereal food for man that the world produces. In nutritive value it is on a par with its only and more costly rival, wheat. For the benefit of those who doubt this statement the following comparison of the food value of wheat bread and corn bread (such as that referred to as being popular in the Southern

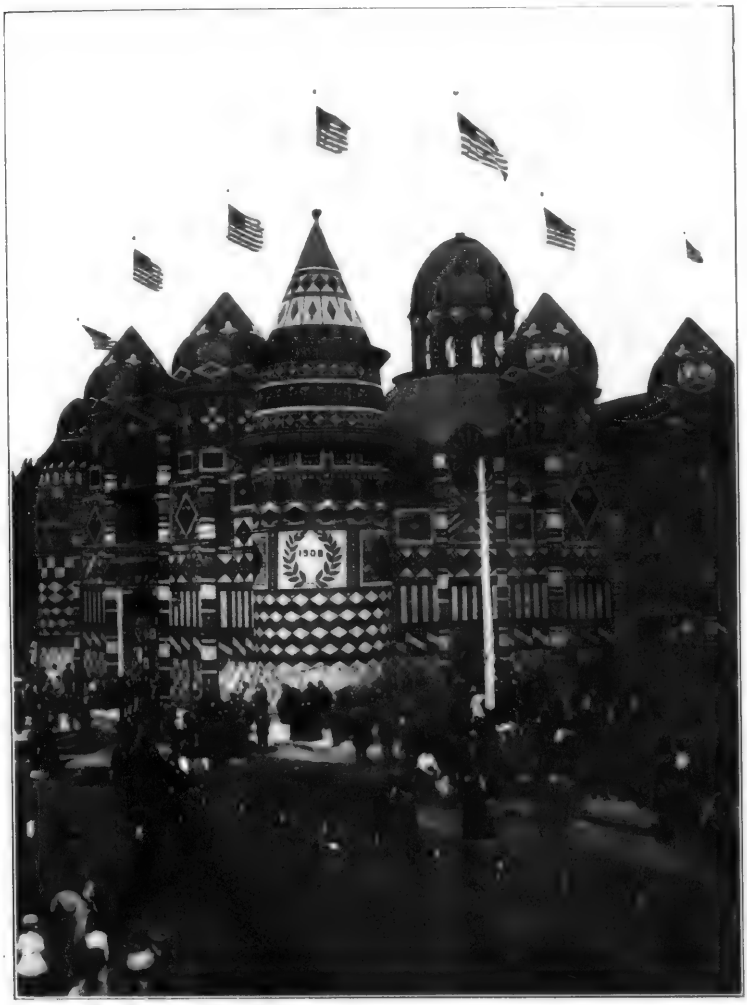


Photo by Underwood & Underwood, New York.

A CORN PALACE IN SOUTH DAKOTA.

Even in the northernmost States of the United States, such as North and South Dakota, corn is successfully cultivated. During the year 1915 no less than 3,250,000 acres in South Dakota were planted to corn, the resulting crop being 94,250,000 bushels, or an average of nearly 30 bushels to the acre. In the fall of the year, when the crop has been harvested, agricultural fairs and other forms of celebration are instituted. Upon the occasion of one of these celebrations at Mitchell, S. Dak., a large building called the "Corn Palace" was erected and the exterior and interior decorations were all made of various parts of the corn plant, including the grain, ears, cobs, stalks, and leaves, forming a most artistic scheme of ornamentation.

LANDING AT OCOS, GUATEMALA.

The open harbors along the Pacific coast of Central America make it impracticable to build wharves up to the beach, and lighters are resorted to for landing passengers and freight. Exposure to the hot, humid, and sometimes damp atmosphere has its effect especially on foodstuffs, and in the preparation of these for tropical trade the manufacturer must take these elements into consideration. Until he does he can not attain the maximum results in his efforts to win these markets.

States of the Union), made by well-known chemists (Atwater and Wood, and Dr. Robert Hutchinson), may be of interest:

	Wheat bread.	Corn bread.
	Per cent.	*Per cent.*
Water	40.0	38.0
Protein	6.5	8.5
Fats	1.0	2.7
Carbohydrates (starch, sugar, etc.)	51.2	47.3
Cellulose	.3	.....
Ash	1.0	3.5
	100.0	100.0

From which may be seen that corn bread is drier by 2 per cent, contains 2 per cent more protein, 1.7 per cent more fat, and less starch than wheat bread. Furthermore, experiments have shown that 90 per cent of the dry matter of corn bread is absorbed, as against 82 per cent of the wheat bread; of the protein of maize but 19.2 per cent escapes absorption; in wheat about 20 per cent is lost. Taking into consideration its cheapness, maize is the best food for man and beast that the world has ever known—and the world owes it to the American Indian.

WHAT CENTRAL AMERICA BUYS[1]

WE should like to obtain some business in Latin America is a thought that is expressed by countless manufacturers all over the country, especially at this time when trade expansion with our southern neighbors is occupying so much attention from the commercial world. The idea of the manufacturer seeking foreign outlets for his product may be due to any of a number of reasons. It may be that the total output of his particular product is in excess of the demands of the home markets; perchance there is a lull in the local marts; or it is even possible that enjoying the maximum of business in domestic fields, the manufacturer feels that a natural expansion into foreign lands would be a logical step in his commercial growth. But be the reasons what they may, once the germ of going after foreign business finds lodgment in the producer's mind, the next step of putting the idea into action, is bound to follow.

It is at this stage that the would-be exporter turns for advice and counsel to those in touch with the Latin American trade situation,

[1] By Harry O. Sandberg, of Pan American Union staff.

RAILROAD STATION AT ESCUINTLA, GUATEMALA.

New railroad stations call for construction material of many kinds. Where United States capital is interested in development work, the result is usually substantial increases in the volume of imports from the United States. In Central America there are heavy United States investments and in return the latter country enjoys over 50 per cent of the foreign commerce of Central America.

and he is pleasantly surprised to find that the bureaus of information and other agencies of trade expansion at his disposal are numerous and authoritative in character; for the widespread interest which has developed throughout the United States in a closer interweaving of commercial and financial relations with the countries of Central and South America has brought in its train information bureaus, foreign trade services, and periodicals devoted exclusively to Pan American matters. In addition, commercial organizations and boards of trade, harkening to the call from their respective memberships for facts and figures concerning these countries, have organized special divisions for the dissemination of such information. Moreover, the activities of the Bureau of Foreign and Domestic Commerce with its district offices, commercial attachés, and commercial agents, the rich fund of consular material, and the work of the Pan American Union, combine to form a mine of official and authoritative sources which for quality and quantity can not be rivaled by the corresponding agencies of any other country.

Then comes the consideration of the general plan for entering these fields, and the manufacturer learns that for reasons of expediency it is best to divide the Latin American territory into convenient geographical groupings, to regard these groups as so many entities, and to focus his attention and concentrate his efforts upon each section separately. Thus, for example, South America could be readily divided into the east coast countries including Argentina, Uruguay, and Paraguay; Brazil may be taken separately or included in this same division; the west coast section would include Chile, Peru, Bolivia, and possibly Ecuador. Colombia, Venezuela, and Panama could also be combined. In the West Indies the Dominican Republic, Haiti, and Cuba would form a natural division; Mexico is worthy of individual attention, while Central America affords a convenient combination of countries.

Following the suggestion of distributing the territory in such convenient groups, the prospective foreign trader will hear a good deal about how to go after the business, actual and potential, available in those lands. He will be told about long credits; about shipping and packing; about the type of drummer not to send and the character of salesman to send; and there will be emphasized the necessity of investigating carefully and studying closely the particular needs of the "to-be-invaded" countries. And Mr. Manufacturer, listening to all this advice, will remark that he has heard these subjects discussed so much and has read so many articles along these very lines that it is like a twice-told tale. And yet the fact remains that these fundamental principles can not be reiterated too frequently nor emphasized too strongly. It is by persistently hammering away at these elementary and rudimentary thoughts that the

HOTEL BUILDINGS IN CENTRAL AMERICA.

The upper picture shows a typical hotel in a town on the Atlantic coast. The lower illustration is typica of the hotel buildings in the capitals and larger interior cities. These hotels need, of course, ename and glass ware, cooking utensils, furniture and furnishings, and other ordinary supplies. Frequently they have cafés attached and are the main dispensers of drinks, soft and strong. By studying the peculiar needs of such hostelries there is a field for developing greater business.

American exporter has been awakened to an appreciation of the difference in the conduct of business at home and in Latin America and that he has profited by these admonitions. If the manufacturer contemplating a foreign campaign would only give heed to the warnings of those whom he consults, carrying out the little suggestions which seem to him so unessential and yet which are in many cases most consequential, frequent fruitless attempts to do business abroad would be more fruitful; trips of ill-qualified salesmen would be prevented, and much money spent in the wrong direction would be diverted to appropriate channels bearing profitable results.

And yet the progress that United States manufacturers and exporters have enjoyed in their business relations with Latin America is as remarkable as it is encouraging and significant. In a period of 16 years, from 1897 to 1913, the commerce with those countries increased from $910,422,499 to $2,864,876,224, or about 215 per cent. This constant annual increase of over 13 per cent, as shown by the comparison, represents a larger trade development than has taken place in any other considerable part of the world during the same period.

During the year 1913, the last normal year prior to the outbreak of the war, the United States enjoyed a total trade with its sister Republics greater than that of any other nation in the world. And even since the war, though the volume of Latin-American trade has fallen off in its totals, yet in relative terms the United States has made greater gains than has any other country. So it is quite obvious from the results that Mr. Manufacturer has been giving attention to all details.

In reaching out for newer markets many firms adopt the policy of starting near home and working southward gradually, and not a few concerns select Central America as a field of operation. Here is a group of countries, within easy access of the United States, and typical of the countries south of Panama. A four days' sail from the Gulf ports of this country brings one to Guatemala, the northernmost country of the group, and stretching southward are the other countries—Salvador, Honduras, Nicaragua, and Costa Rica. The combined area of Central America is 174,065 square miles, or slightly larger than the combined area of the New England States plus New York, New Jersey, Pennsylvania, and Delaware. Together they have a population of five and a half million peoples. In these countries Mr. Manufacturer will find every variety of climate from torrid heat at sea level to temperate conditions in the higher regions and cold on the mountain heights. He will see natural wealth and resources, practically untouched, in the way of mines, forests, agriculture, and cattle; highway construction, railroad building, and development of hydroelectric power will stand out as potential oppor-

DISCHARGING FREIGHT AT LA UNION, SALVADOR.

Conditions of this kind emphasize the necessity of giving particular attention to preparing foreign shipments. A sudden downpour or an accidental dropping of a bundle would subject the commodity to a severe water test, and unless unusual care is given to this feature of the foreign shipment satisfactory results will be slow in coming.

tunities for investment. And when he commences to do business he will discover most of the methods, customs, conditions, and individual peculiarities that are characteristic of Latin American trade. Each Republic has its separate laws, tariffs, and customs duties. Each has its own regulations for commercial travelers; some impose a municipal fee, and others require payment of regular customs duties on samples. Enforcement of these rules are not, however, very onerous. While Spanish is the language of all these countries, yet a great deal of English is spoken, particularly by the merchants and bankers. Especially where United States capital is active in development work, English is very generally spoken, and such places present a strange blending of the North American city with a tropical atmosphere and background. So while a knowledge of Spanish is quite desirable it is not an absolute necessity.

But what goods can be sold in Central America? What do the countries need? What do the people use? How big is the market down there? These are natural questions, but not very difficult to answer. To name specifically and categorically all the things and classes of commodities which are used would be to enumerate all the manufactured products of the United States and of Europe. The extent of the market can be judged from the total trade which these countries conduct. In 1913 the foreign commerce reached the sum of $81,740,558, the exports amounting to $45,823,504, and $35,917,-054, representing the value of the imports. The United States shared to the extent of $18,761,159 in their imports and $17,635,924 in their exports.

In determining the needs of the several countries and the character of goods adapted to their trade one of the chief factors to consider is the location and physical conditions surrounding them. For instance, the class of wearing apparel in a hot coastal town naturally differs from that used in a cool mountain city many thousand feet above sea level. A city with well-paved streets and roads offers a field for motor vehicles, while it would be a waste of time and money to introduce automobiles where adequate road development does not exist. Local conditions must govern and a careful study of each country would develop the salesman into an ambassador of commerce, a type that is most desirable and welcome in the Latin American countries.

While it is impossible to point out all the potential opportunities for each country, still, looking over the field as an entity, various possibilities stand out as being of common interest. All the countries are agricultural. They have soils that are fertile and productive. The big estates and plantations employ modern methods, devices, and machinery. But the thousands of individual farmers still use simple agricultural implements. Here, then, is a chance for

SCENE IN LA LIBERTAD, SALVADOR.

In the interior towns of Central America there are usually branch stores of the important commercial houses of the capital city. These stores need special articles to meet local needs. Once, however, the manufacturer becomes familiar with these wants and caters to them, he is establishing a foothold that will prove valuable.

some cooperative constructive organization work on the part of manufacturers of agricultural machinery. As aptly observed by Special Agent Garrard Harris, of the Department of Commerce, there appears to be a market of tremendous possibilities in this line. The local governments would doubtless receive with favor and assist in the execution of a proposal to go through the country and at various points give actual demonstrations of deep plowing, harrowing, and the proper cultivation of corn, wheat, barley, rice, beans, and other such crops. The countries could thus raise enough of these staples for home use and do away with the present necessity of importing large amounts. A simple lecture in Spanish and possibly an arrangement for placing such machinery within the financial reach of the smaller planter would mean the beginnings of a big business.

Closely allied to such a move would be that of introducing and encouraging the use of cheap and simple sugar-making outfits which would permit the extraction of a larger percentage of juice from the cane. Also an effort could be made to increase the number of American machines in the large coffee estates. Every one of these countries has numerous *fincas* but the majority of them are equipped with European devices.

Since the outbreak of the war there has been much difficulty in securing the jute bags and sacks for the crops, and cotton bags are coming into favor. The Governments are making favorable concessions in the way of duty reductions and a big business is already taking place in this line.

A greater development of agriculture is followed by extensive projects in road building. In fact this is a matter that is engaging the attention of all countries continually. A good deal of such work is done by prison labor and home engineers, but contracts for paving, surveying, and laying out highways are not of infrequent occurrence. Incidental to this development would be measures of sanitation and sewage and the installation of hydroelectric power and lighting plants.

Progress along such lines introduce still other possibilities, particularly that of motor vehicles. Costa Rica, Honduras, Salvador, and Guatemala show increasing use of automobiles and automobile trucks. Of motor cycles there are yet few. Cars that can stand the heavy strain of mountain climbing and rough roads have the best chance in those countries. Autos for pleasure driving as well as autobusses and autotrucks are part of the needs of this territory.

Then again construction material should find a still larger market for with but a single exception there was considerable construction work in all the countries. Wooden frame buildings, detached, and of the bungalow type, are going up at various points. In Salvador, reinforced concrete and poured cement seem to be the favorite style.

WHARF AT LA CEIBA, HONDURAS.

This represents concretely what foreign investments mean. A New Orleans concern is developing vast areas of banana and sugar lands in Honduras. Most of its machinery and many of the higher class help come from the "States." In addition it maintains a steamship service between Honduras and the United States, as well as operates long stretches of railroad to the plantations. This wharf was built by that company. As a company extends its development work so does the volume of business with the United States grow in proportion.

Many buildings have light pressed steel walls with roofs of tin and corrugated iron.

New buildings call for up-to-date furnishings, electrical effects, set plumbing, and interior decorations. Artistic chandeliers and fancy dining room domes should find buyers among the better classes. Heavier articles of furniture are usually made in the country by native cabinetmakers. The variety and attractive character of their lumber enable the home cabinet shops to turn out a highly artistic class of furniture. Yet certain pieces are imported. For example, a great many chairs of the bent-wood cane bottom type are used. These come mainly from Germany and Austria. They arrive in a "knocked down" state and are put together with bolts and screws. Glued furniture does not meet local conditions. It would seem that this is an article worth while competing for. Along with cane chairs furniture people might increase the sales of rattan and wicker tables, settees, tabourettes, and similar articles. With so much out-in-the-open life due to the courtyards in the homes, swings and lounging chairs so common on our big porches might be sold.

In connection with the home it was surprising to the writer to find how scarce victrolas and piano players were in those countries. But few of the homes where the families want for little in the way of comforts or luxuries had these articles. This is especially strange since ever so many homes have pianos and in passing through the streets it is not unusual to hear the sounds of several instruments in the same block—here the strains of an opera, there the melody of some popular song, and in a third the very evident chords of some beginner practicing a lesson.

Anent this subject the writer is of the opinion that if advertising campaigns were organized and conducted in the same manner as they are in the United States the result would be equally gratifying. Such a campaign followed up with the personal representative system would be very effective. A manufacturer thinks very little of spending many thousands of dollars in advertising in this country to increase his sales or even to create a demand for a new article; and yet in foreign fields he believes he has done enough if he has sent a salesman on a cursory trip through a country.

Sporting goods should find increasing sales. The students returning from Europe and the United States bring home new ideas. Baseball is played in all the Central American countries. Rugby is equally popular; tennis, of course. Even golf is attempted, and the writer enjoyed his first round on the links in Tela, Honduras, on an improvised field. While pool and billiard tables may be found in the clubs and in some hotels, little has been done to introduce the parlor table. Bowling is another sport which does not seem to exist

SUGAR PLANTATION FACTORY IN NICARAGUA.

While the big sugar and coffee estates have extensive modern machinery for preparing their product, the small plantation owner still uses simple and even somewhat antiquated methods. A very cheap and simple sugar-making outfit might find a ready market in these countries. Also other agricultural implements would sell if the prices could be kept to a minimum and arrangements made so that the small farmer could purchase them on easy terms.

in Central America. Possibly an alley or two placed in the capital cities might offer lucrative returns.

Ready-made clothing and haberdashery are due for a large development. At present Guatemala and Costa Rica seem to be the only countries where fairly good ready-made clothing may be obtained. The people in these countries have been accustomed to tailored garments, and it will probably be some time before ready-to-wear clothes will assume the popularity they enjoy here. It is the confident belief of the writer that a big boost for the clothing trade and kindred lines would be the establishment of a display room under the joint cooperation of the interested trade associations. Here could be exhibited bright, snappy styles of clothing, and use could be made of those striking advertisements and illustrations that adorn our own street cars and take up so much room in the popular magazines. In such a showroom not only clothes but underwear, hosiery, shirts, bath robes, shoes, and similar lines might be displayed.

Bottling plants exist in many places, manufacturing soft drinks as well as beer. European machinery predominates. The writer recalls meeting a salesman of bottling machinery from St. Louis. It was his initial trip and he did a little business. However, he made known the superior qualities of his apparatuses. If the factory will follow up its salesman's trip with judicious correspondence and within another six months arrange another personal visit, its investment will bring returns. If it is discouraged at the smallness of the business resultant from effort number one, it may have missed its opportunity. Incidentally the writer might observe that a satisfactory arrangement would have been for this firm to have cooperated with some other concern of a correlated line—as, for instance, glass bottles—in sharing the expense of that trip. A great number of bottles of a special class is annually imported from Europe.

Turning to foodstuffs and beverages, there is simply this observation to make: More United States products could be sold if greater attention were paid to the needs of the market. A greater part of the wines and liquors come from Europe, but at present it is difficult to get supplies from there. The time would therefore seem to be propitious for the American manufacturer of wines and brandies to push the sale of his product and establish a permanent foothold. It is even rumored that a good part of the liquors imported from Europe by Central America and bearing the label of European countries are really produced in the United States, sent to Europe in casks, and there bottled, labeled, and sold as of European derivation.

In the matter of mineral waters the writer had difficulty in getting United States brands. At hotels and in cafés he was obliged to drink English or French waters, although he asked for the better known American products. In two of the countries a particular

SCENE IN A CENTRAL AMERICAN COFFEE WAREHOUSE.

Because of the difficulty in securing jute sacks for bagging the coffee, sugar, and other crops, planters are buying cotton bags. With liberal allowances in the matter of custom duties, manufacturers catering to the needs of the agricultural interests are finding a profitable market.

American brand was well advertised and sold everywhere. In three other countries the principal hotels or cafés served European waters but had none of the American.

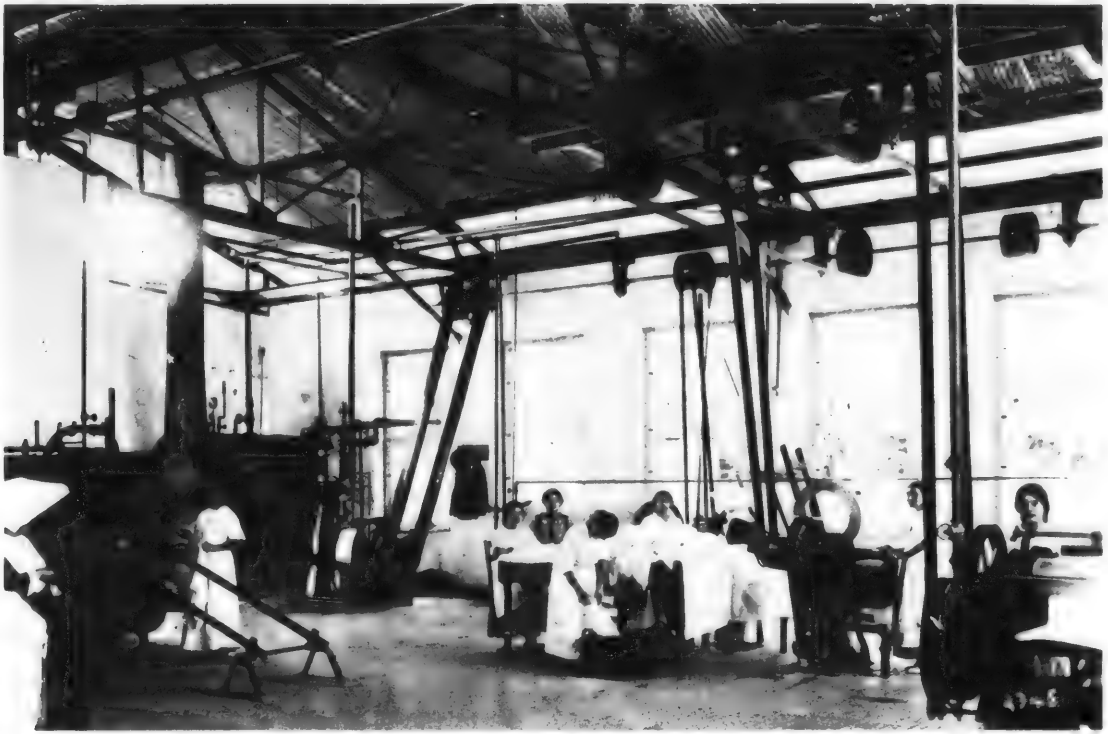
Canned goods, too, should find a broader field. Everywhere the writer noticed a preponderance of the European product. Jams, preserves, canned cherries, apricots, plums, string beans, peas, and other vegetables, salmon, codfish flakes, flaked halibut, crab meat, sardines in tomato sauce—in fine, all classes of foods of this character—ought to have greater sales. Of course, special attention would have to be paid to the packing of these articles and preparing them to withstand certain climatic conditions; but with judicious advertising and a close watch of the market results would warrant the effort.

An example of this kind of attention was noted in connection with confectionery and biscuits. A well-known concern in the United States entered the field seriously. It is making candies to meet conditions. Because of exposure to the moist and warm atmosphere, candies, and especially chocolates, soon become stale, moldy, and lose their consistency. They require special packing in air-tight containers, preferably of tin. In one country a popular ice-cream and confectionery parlor had an attractive display of candy made by this American firm. From the large, fresh stock it continually had on hand it was apparent that the candies were popular. Incidentally it was a profitable business for the proprietor for the writer paid $2.50 for an ordinary 60-cent pound of chocolates. What is true of candy is likewise true of crackers and cakes. It is now possible to buy an American biscuit in the Tropics and find it fairly crisp and tasty. But in fairness it ought to be said there is still room for improvement to meet the better known European brands.

These, then, represent a few of the more patent opportunities for trade development in Central America. Of course they do not pretend to be the least bit comprehensive but merely indicate certain tendencies in the line of imports in which the United States might share to greater degree than it does at present. Of other articles that might be sold no enumeration can be attempted.

In his very able monograph on Central America as an export field, Special Agent Harris makes a number of valuable suggestions and the writer takes the liberty of quoting from this work certain paragraphs bearing on the future trade possibilities of Guatemala, Honduras, and Salvador. Concerning Guatemala, Mr. Harris states:

> It will be many years before Guatemala begins to be independent of other countries for manufactured articles, and some attention to the market on the part of manufacturers of coffee, sugar, shoe, and woodworking machinery (principally hand and foot power), tools, implements, hand looms, rice-cleaning apparatus, irrigation machinery, portable sawmills, and apparatus for utilizing the abundant water power, will undoubtedly result in considerable business.



THE LAUNDRY ROOM OF A HOSPITAL IN SAN JOSE, COSTA RICA.

Machinery of various kinds should find increasing sales in Central America. With the establishment of new institutions and the modernizing of older ones opportunities present themselves for the expansion of business in many lines.

Concerning Honduras, he writes:

Proximity to the United States, good steamship service, and the fact that American business men are learning how to compete with foreign houses, all indicate that the commerce between the two countries will continue to grow and be satisfactory. With the eventual opening up of the country by railroads, there will come a demand for all sorts of machinery, woodworking, mining, agricultural, roadbuilding, electric lighting; equipment for ice factories, railways, and machine shops; iron piping, sewer and drain tile; office equipment; in short, everything required by a developing country of natural richness and resources.

For Salvador he presents the following observations:

It may be noted that the list of imported commodities in which goods of American make form ordinarily a negligible part is quite long, including candles, hats, paper, furnishing and fancy goods, stone and china ware, printed books, wooden goods, and matches. * * * There may also grow markets for American agricultural machinery and implements, and for seeds and fertilizers. A market for road-building and repairing machinery may also be expected, for the roads must sooner or later be developed. There will probably never be many railroads in Salvador, and motor-driven vehicles are the most likely transportation of the future.

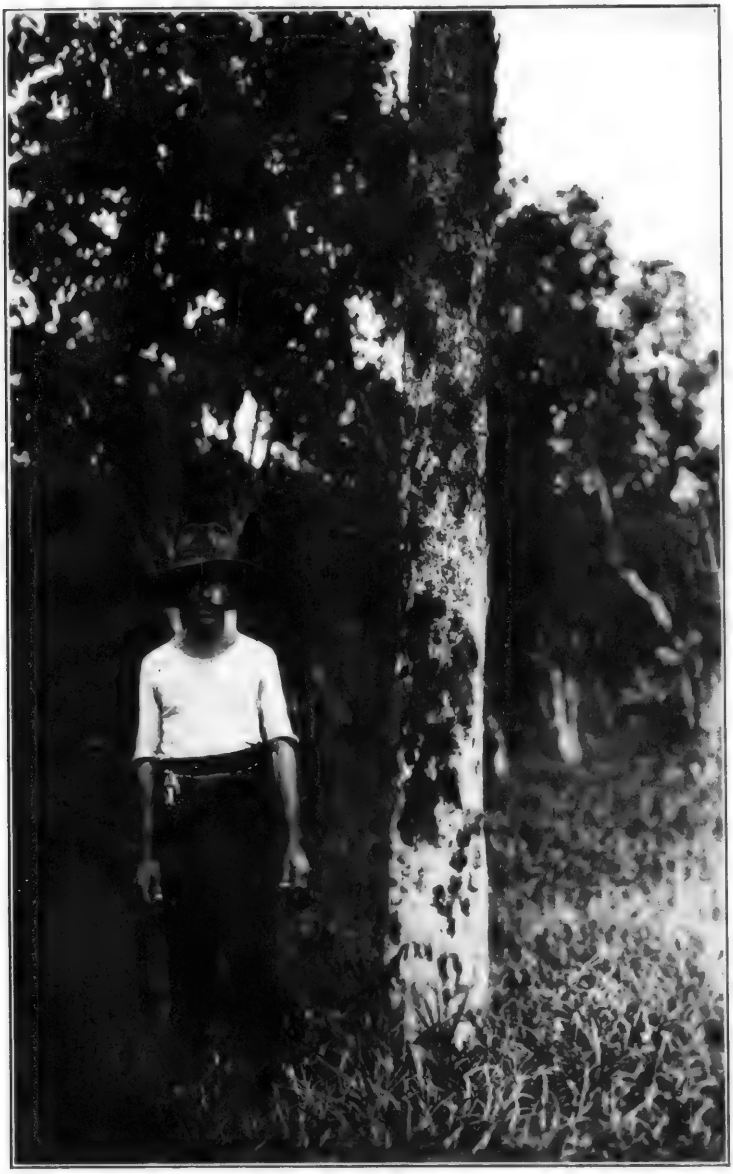
THE AFRICAN MAHOGANY, A PROMISING TREE FOR TROPICAL AMERICA

THE professional forester in the United States often has occasion, when asked by his tropical American correspondents, to advise them as to the kinds of trees most suitable for planting in their respective localities and to urge them to pay particular attention to the well-known and valuable indigenous trees, such as the mahogany and cedar. The forester never hesitates recommending valuable native trees for shade or commercial planting for the reason that, while it is pretty certain that the climatic conditions must be favorable for the native trees, the attempt to grow trees from a totally different climate is at best often hazardous and attended by great difficulties which cost much time, labor, patience, and money. However, the object of this article is to urge tree planters in tropical America not to devote the whole of their attention to the native trees, but to strive to propagate on a large scale some useful timber trees from other regions of the world.

Among the many species of economical timber trees of West Africa and now occasionally found planted in tropical botanical gardens is the African mahogany (*Khaya senegalensis*), which gives

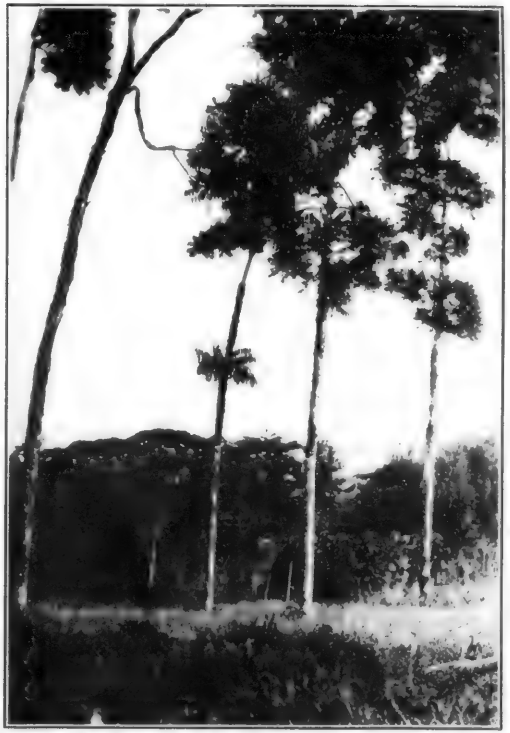
LEAVES, FRUIT, AND FLOWERS OF THE AFRICAN MAHOGANY TREE.

The African mahogany bears leaves somewhat resembling those of the ash, and clusters of small flowers in panicles. Its fruit is a woody capsule which contains many winged seeds. Owing to the great height of the trees the seed is not easily collected, but they can be obtained through consular officials in Senegambia. They germinate readily, and the young as well as the old trees are remarkably free from disease.



TRUNK OF THE AFRICAN MAHOGANY TREE.

The African mahogany (*Khaya senegalensis*) is a tree indigenous to the tract of country extending from the Atlantic to the Indian Oceans in the tropical parts of Africa, being the most important tree that has such an extensive range in that continent. Its timber has been one of the chief sources of revenue for Sierra Leone, Lagos, Kamerun, Angola, and parts of the Kongo It is also found in the forests bordering Mombo River and along the caravan route which leads from Tanga to Masinde in German East Africa. The extensive natural range of the tree leads to the belief that it can readily be extended artificially to include tropical sections of the Americas, and such artificial propagation has already been accomplished in Trinidad, British West Indies.



AFRICAN MAHOGANY TREES GROWING IN TRINIDAD BRITISH WEST INDIES.

The above pictures were taken in 1914, when the trees were just 14 years old. They measured about 10 inches in diameter 3 feet above the ground and were approximately 40 feet high. The tree naturally produces a long, straight stem when planted in a close stand; and even in the open, as shown in the illustrations, the trunks shoot up and the branches appear only at the top. The crown is usually open, and while the tree is young it bends like a whip in times of a gale. The trees are therefore seldom broken or uprooted by storms even when fully exposed. In its native habitat the tree attains great size, the trunks being often 3 to 4 feet in diameter and, tapering slightly, rise to a height of 40 to 60 feet to the first branches of the crown.

promise of a suitable and profitable kind for ornamental and commercial planting in the West Indian Islands and on the Spanish Main. It is a tree indigenous to the tract of country extending from the Atlantic to the Indian Ocean in the tropical part of Africa. It is probably the most important tree that has this extensive range of growth in Africa. Its timber has been one of the chief sources of revenue for Sierra Leone, Lagos, Kamerun, Angola, and parts of Congo. It is found also in the forests bordering Mombo River and along the caravan route which leads from Tanga to Masinde in German East Africa. This species occurs also in the Upper Nile region, especially in the sections known as Djur and Nyassaland, but it is rare at this distance from the coast, and in fact is far more abundant in West Africa, where the tree has been exploited for over 30 years. According to authentic literature, the African mahogany is very common in the region of Cape Verde and along the Gambia River, where it is called by English-speaking people Gambia mahogany. In the French provinces the tree is known as cail or cail-cedro. The natives of West Africa have named it hie, jallow, dubina, and oganwo.

The first observations in regard to the distribution of this tree were made by Guillemin and Perrottet in their book entitled "Flora Senegambia." In this work it is stated that Gambia mahogany is among the largest and most beautiful trees along the coast of Gambia and on elevated parts of Cape Verde Peninsula. It is very abundant in the district of Barguy, where it forms the principal stand of the forests. In Senegal this tree is now being planted on a commercial scale by the French, because it produces a very valuable wood, which has attained considerable importance in the trade. Upon the whole, there is scarcely a tree in West Africa which deserves more attention, for when the beauty and usefulness of its wood are taken into account there is no other tree that can compare with it.

The extensive natural range of this tree leads one to believe that it can readily be extended artificially, and such artificial propagation has already been accomplished in Trinidad, where the African mahogany is growing successfully, as shown in the accompanying illustrations. These pictures were taken in 1914, when the trees were just 14 years old. They measured about 10 inches through 3 feet above the ground, and were approximately 40 feet high, which is a remarkable record for a tree yielding such a hard and heavy wood. There is no native tree of equal value that would attain such proportion in so short a time. The tree by nature produces a long, straight stem when planted in a close stand; even in the open, as may be seen from the illustrations, the stems shoot up and the branches appear only at the top. The crown is usually open, and while the tree is young it bends like a whip in times of a gale. For this reason the trees are seldom broken or uprooted by the storm, even when fully

exposed. In its native country the tree attains enormous proportions. Stems from 3 to 4 feet through near the ground and with little taper rise 40 to 60 feet to the first branches. Its rapid growth, adaptability to all kinds of soil and conditions, and straight growth render it one of the most desirable trees for commercial planting in tropical America.

Unfortunately, not so much is known of this tree from a scientific point of view and it is a relatively recent introduction in tropical America, but the chief thing to know now is that the tree will grow and grow quickly into commercial sizes. Under favorable conditions the African mahogany will grow at least 2½ feet per year during the first 14 years. In its native land it is long-lived and often reaches a maximum height of 150 feet. Judging from the character of its growth, the small size of its crown, and the long, straight, clear bole, the trees may be planted close together without crowding them. The yield per acre would, therefore, be very large in comparison with that of Spanish mahogany or cedar, both of which have rather large and somewhat spreading crowns. A typical African mahogany is one of the most beautiful trees and affords a pleasing contrast to the other trees in the Tropics. Owing to the great height of the trees the seed is not easily collected, but they can be obtained through consular officials in Senegambia. They are rather expensive, but they readily germinate, and the young and old trees are remarkably free from disease.

If the object of a plantation is simply wood without regard to kind and quality, it will be advisable to plant eucalyptus or Australian pine (*Casuarina*), for both of these easily outgrow the African mahogany. But there is now and always will be an abundance of wood in the Tropics; the kinds that have a value in the world's markets and have stood the test of time are rare and rapidly becoming scarce and more expensive. The wood of the African mahogany is prized beyond all others as a substitute for the true mahogany of tropical America. In color and grain it resembles the latter, and has other properties that render it exceptionally valuable for making handsome and expensive furniture.

THE PAN-AMERICAN RAILWAY

IN the last 27 years, that is to say, since the countries of the Western Hemisphere have been meeting together periodically to consider subjects and matters of reciprocal interest the idea of the international railway has stood out prominently, and it may be said that from a certain point of view this idea constitutes the hub of practical Pan-Americanism. Not a single one of the American Republics but has given thought to this subject and has made its contribution, within the period mentioned, to a realization of this important project. Also, it is rare that any statesman in considering means for making effective the ideal of drawing together and of mutual respect which is bound up in Pan Americanism, has not given first place to the work in question. It would appear, then, that by common consent the peoples of the three Americas saw in the rails of the projected road indispensable bonds of solidarity and union, as if they contemplated beforehand the column of smoke which from one extreme of the continent to the other will be emitted by the engines running on these rails as the herald of a long cherished wish.

Among the publications that recently have appeared in relation to this subject of manifest opportunity and great moment, figures the work entitled "El Ferrocarril Pan Americano" (The Pan American Railway), by the distinguished Chilean engineer, Don Santiago Marín Vicuña. This work considers the two primary phases of the project, which are its political and economic significance and how to bring it to a successful realization. According to Señor Vicuña, the Pan American Railway is the best corollary of the modern and continental interpretation of the Monroe Doctrine, for in cases of conflicts such as that which to-day throws its shadow over the whole world, all America might come in touch not only in unity of thought and action but in a financial and commercial unity. "An America," says Señor Vicuña, "is to be desired, free in its action, unlimited in its commerce, and respected in its purposes—an America that purveys to itself, an America that moves in its own orbit. And for this is indispensable along with a unity of methods the creation of a Pan-American merchant marine and the completion of the Pan-American Railway, weighty factors not as yet in existence, but which it will be necessary to create at the cost of whatever pecuniary sacrifice."

After setting out in detail what has been done since 1889 toward the realization of the continental railway, the author advances the

opinion that in order to convert the idea into a tangible reality it is necessary to concert an international agreement that shall fix the definite routes of the work and shall indicate the economic means for realizing it, in a word, the formation of an international program of work, of exact standards in routes, gauges, tariffs, etc., which will facilitate and render the work efficient.

For the success of the proposition the writer likewise believes to be indispensable the preparation of a general chart which shall show all the American railways annexed, to which should be a memorial explaining the commercial and political importance of each of the railways and containing likewise the technical features of the same.

Notable are the facts which the writer has brought together in his book regarding the extension of the railways of the several American countries. These facts show that the Pan-American Railway is an accomplished fact as to Canada, the United States, and Mexico.

He shows also that the logical route of the Pan-American road must be subordinated to two important and not parallel conditions, viz, smallest mileage and greatest effective use.

According to the table presented by the author, the three Americas had in operation in 1914, 725,100 kilometers of railways of which the United States, Mexico, and Canada had 640,000. In the other American countries the figures in kilometers were as follows: Guatemala 1,000, Salvador 200, Honduras 200, Nicaragua 300, Costa Rica 800, Panama 100, Colombia 1,200, Venezuela 950, Guianas 300, Ecuador 750, Peru 2,800, Bolivia 1,900, Brazil 26,000, Paraguay 600, Uruguay 3,500, Argentina 34,000, and Chile 9,000.

The author points out sufficiently clearly the route that in his mind the Pan-American Railway should follow. The most notable feature of the plan described by the author in so far as it respects South America consists in placing La Paz, capital of Bolivia, in the splendid position of radiating center of the Pan-American connections going to Peru, Brazil, Paraguay, Uruguay, Argentina, and Chile. The capitals of the countries mentioned are distant from La Paz as follows: Lima via Puno and La Oroya, 1,790 kilometers; Rio de Janeiro via Puerto Suarez, 3,000; Asuncion via Pilcomayo, 1,800; Montevideo via Paysandu, 3,230; Buenos Aires via La Quiaca, 2,640; and Santiago via Baquedano, 2,600.

Bearing in mind the facts which have been published regarding the part of the intercontinental railway already built, the author believes there is no exaggeration in saying that at present there remains only 25 per cent unconstructed, allowing that countries such as Canada, the United States, Mexico, Paraguay, Uruguay, Argentina, and Chile have finished their quotas and that others, such as Peru, Bolivia, and Brazil, have theirs well under way.

As to that part remaining to be constructed, which in the opinion of the author is the most difficult and costly, he thinks it prudent to estimate this at $35,000 per kilometer, which would indicate an expenditure of $150,000,000 for the whole unconstructed part.

According to the author the Pan-American Railway, far from being a menace to merchant marine, will be a powerful and efficacious help.

In noticing the work of Señor Vicuña, THE BULLETIN improves the opportunity to express to the author the acknowledgments of the Director General of the Pan American Union, Mr. Barrett, for the compliment of dedicating to him this so important and timely work.

PAN AMERICA IN THE MAGAZINES

Cuba's New Rival for Jute is the title of an interesting account in the May number of The Americas (published by the National City Bank of New York) of a weed that seems to give great promise as a substitute for jute. The situation in regard to the supply of sacking material used in the marketing of various products has become acute and the recently developed necessity for some cheap fiber to take the place of jute may result in the creation of a new industry for Cuba and other tropical countries where this weed is indigenous. The matter is fully explained in the article herewith reproduced:

The jute bag, or gunny sack, is of great importance in the world's commerce. It is used in world-wide distribution of half a dozen of the "great" commodities, like coffee, sugar, grain, cotton, wool, etc., and in packing of merchandise; and while as packing it is of secondary importance and value in every one of millions of individual transactions in commerce, all the jute used in the world together in a year aggregates so high in value as to put its commercial rank higher than some of the raw materials we hear much more about. India exports over a billion yards of jute cloth a year and over a third of a billion gunny bags, to say nothing of a billion and three-quarters pounds of the raw jute "yarn," and realizes something like $200,000,000 for it. The leading commercial nations buy jute in immense tonnages, England about 600,000,000 pounds a year, Germany about 300,000,000 pounds, the United States about 220,000,000 pounds, while Argentina, Brazil, and other great producers of raw commodities buy in quantity that costs a very considerable proportion of the amount they receive for the commodities. The war, through disorganization of transportation, has greatly increased the cost of jute bags to these exporting countries, and the matter was of so great importance that Argentina, for one, is expending Government funds in the attempt to find a way to escape the use of jute, which in 1915 cost her over $7,000,000 more than in the year before.

This situation has stimulated the interest of several tropical or subtropical countries in the possibilities of native plants from which fibers that closely resemble jute are obtained. Among these is Cuba, which produces a plant called *malva*, a weed growing

Courtesy of The Americas (New York).

MALVA, A CUBAN RIVAL FOR JUTE.

Samples of this fiber as treated in the rather primitive ways improvised by men cultivating it in Cuba have been examined with much interest by manufacturers of gunny cloth in the United States, and there appears to be a likelihood that it can be employed with success, either pure or mixed with jute, in the making of bags. If this proves true, Cuba has discovered an important new industry as a result of the war. Malva is a weed which thrives in nearly all parts of Cuba and also in certain parts of Central America, Mexico, Florida, and in certain sections of Spain. The above picture gives an idea of the length of the fiber.

Courtesy of The American.

MALVA AND JUTE FIBER.

Left: Strands of malva. Center: Malva and jute mixed. Right: Jute fiber. The malva plant grows to a height of as much as 20 feet, but its average height is between 6 and 10 feet, with a stalk half an inch to an inch in diameter, from the bark of which a fiber is obtained having about the same tensile strength as Indian Dacca jute, but much finer and more like flax in texture.

wild in many parts of the island, but cultivated in late years for the fiber, which has a limited use for special purposes already. Samples of the fiber as treated in the rather primitive ways improvised by men cultivating it in Cuba have been examined with great interest by manufacturers of gunny cloth in this country, and there appears to be likelihood that it can be employed with success, either pure or mixed with jute, in the making of bags. If this proves true, Cuba has discovered an important new industry as a result of the war.

There are about 11 species of the plant in Cuba, but the kind known as *malva blanca* (*Waltheria Americana* Lin.) has been found to be the most suitable for the production of textile fiber. This plant grows to a height of 20 feet, but its average height is between 6 to 10 feet, with a stalk half an inch to an inch and a half in diameter, from the bark of which a fiber is obtained with about the same textile strength as the Indian Dacca jute, but much finer and more like flax in texture. It is believed that by employing scientific methods in the cultivation and selection of the *malva* plant better results could be obtained both in textile strength and in the fineness and quality of the fiber.

Malva blanca requires a good soil for its cultivation to the best advantage. In reality it is a weed which grows wild pretty much in all parts of Cuba and is regarded by farmers as a pernicious plant interfering with the growth of other vegetation in the localities where it has obtained a foothold; and it is most difficult to get rid of. *Malva* also thrives in certain parts of Central America, Mexico, Florida, and even in Spain, where experiments with it have been made, but it is said that, although some of these other fibers are good, their production per acre would not put the business on as good a paying basis as would the *malva blanca* of Cuba.

A small mill for the extraction and handling of this fiber has been established near the town of Vinales in the Province of Pinar del Rio. The quantity of wild *malva blanca* growing in the Vinales district is very considerable, but in order to establish the industry on a good business basis it would appear to be desirable to make arrangements for its cultivation on a large scale, so as to localize and standardize the work of harvesting, transportation, and handling. For the cultivation of *malva*, the plants are grown from seed sown in rows, and after attaining a height of a few inches the young plants are thinned out, leaving about 44 to the square yard. If planted more widely apart the plants grow too much to branches and leaves.

Seed is collected by hand from the 10th of January to the end of February, and its present cost is about 5 cents a pound. Twelve hundred pounds of seed will plant a caballeria (33½ acres) of ground.

The time for sowing is from March to May, and in three months and a half, when the plants have already attained the height of from 6 to 8 feet or even more, cutting may be commenced. The bark of young plants contains only one layer of fiber, older plants often as many as eight layers. These, however, are much thinner than the single layer in the younger plants, and it is still a matter for study as to the exact age the plant should be cultivated before cutting, in order to give the best results.

Two cuttings can easily be handled in one year without the necessity of replanting, and it is believed that by greater care in cutting, using a corn harvester and binder instead of cane knives, which injure the roots, even more cuttings could be obtained from the same sowing. Cutting can be continued up to about the end of November. In December the plants run to seed.

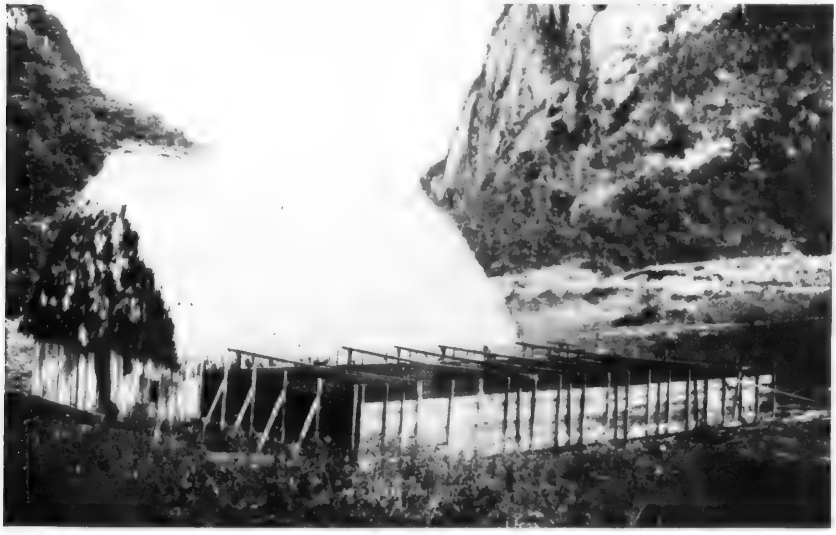
The land for the cultivation of *malva blanca* is prepared as for any other crop by plowing and harrowing. The plants thrive well under almost any climatic conditions in Cuba, and it is said that heavy rainstorms and cyclones, instead of being injurious, are favorable to its growth and development.

After cutting, according to the present system of handling, the green stalks are loaded in wagons, about 2,500 pounds to a wagonload, and transported to any one of numerous sulphur springs and brooks which abound in this district. Here they are

Courtesy of The Americas (New York).

NATURAL POOL OF SULPHUR WATER IN CUBA.

After cutting the malva stalks they are transported in wagons to any one of numerous sulphur springs and brooks which abound in that section. Here they are deposited in the water and held below the surface with rails and allowed to remain until decomposition has set in, which usually takes from 8 to 25 days. This is called "retting."



Courtesy of The Americas (New York).

TANK FOR "RETTING" PROCESS.

When natural pools of sulphur water are not available, tanks are constructed in which a similar solution of water, sulphur, and potash is used. Only the bark is placed in the tanks, and when the retting process is over the bunches of fiber need only to be hung up to dry and the atmospheric action loosens the remaining particles of mucilage and bark from the fiber.

Courtesy of The Geographical Review.

THE LOFTIEST PERMANENT HABITATION IN THE WORLD.

"The thatched stone hut that we passed at 17,100 feet, and that enjoys the distinction of being the highest in the world, was in other respects the same as the thousands of others in the same region. It sheltered a family of five. As we passed, three rosy-cheeked children almost as fat as the sheep about them were sitting on the ground in a corner of the corral playing with balls of wool. Hundreds of alpacas and sheep grazed on the hill slopes and valley floor, and their tracks showed plainly that they were frequently driven up to the snow line in those valleys where a trickle of water supported a band of pasture. Less than 100 feet below them were other huts and flocks." (Prof. Isaiah Bowman in "The Country of the Shepherds.")

deposited in the water, held below the surface with rails, and allowed to remain until decomposition has set in, which usually takes from 8 to 25 days, according to the temperature, warm weather, of course, accelerating the "retting" process.

As these natural pools of sulphur water are not entirely dependable in the dry season it has been found necessary to construct a large tank in which a similar solution of water, sulphur, and potash is used. Added tank facilities are necessary if *malva* is to be cultivated on any extensive scale. The tank is situated near a small barking machine, which has been set up for the purpose of crushing and heating the green *malva* plant, and thus separating the bark from the wood. Only the bark is placed in the tanks. When the "retting" process is over the bunches of fiber need only to be hung up to dry and the atmospheric action loosens the remaining particles of mucilage and bark. After two or three days it is ready to be packed and shipped.

The fiber, having been put into "hands," or in sliver, is ready for shipment, and is packed in open bales of about 400 pounds apiece.

Vinales, which is at present the center of the *malva* industry, is situated about 14 miles from Esperanza, the nearest port on the north coast of Cuba. The cost of transporting by mule wagons is $3 per ton; of shipment by schooner or coasting steamer from Esperanza to Habana, $2.50 per ton. This year there is a very good market for this product in Habana, where it is used for making the soles of cloth shoes, universally used by the laboring classes in Cuba and commonly known as alpargatas.

At present it is used by a local factory in the manufacture of the soles of slippers and for filling mattresses. This factory consumes about 400 tons of fiber a year, and could use more if obtainable. Sugar bags have been so high in price that the use of *malva* is talked of for the purpose, but the industry has as yet no organization. A 3,000,000-ton sugar crop requires approximately 21,000,000 bags, or about 60,000,000 pounds of jute. The importance of determining the possibilities of the plant are obvious for Cuba alone, to say nothing of other markets. The fiber will undoubtedly be found useful in rope and twine making. It has an extensive use, in its primitive form as produced at home by Cuban natives, for making mattresses.

The Country of the Shepherds, by Prof. Isaiah Bowman, in the June number of the Geographical Review (New York), is an interesting study of the topographic, climatic, and ethnographic factors that have influenced the distribution of the population in the Andean sections of Peru. That people of even very primitive character should select permanent habitations at elevations that in some cases exceed 17,000 feet above the sea level—heights at which vegetation is extremely sparse and the cold intense—when pleasanter areas offering much better facilities for the sustenance of life are available, is seemingly a rather puzzling ethnological problem. Prof. Bowman, however, gives a clear and comprehensive explanation of the various factors causing such a state of affairs in Peru, and in the light of geographic comparison the reasons for such an unusual distribution of peoples become plain. In the introductory paragraphs we find some interesting general observations, leading to the study of the particular factors involved in the solution of the problem, such as the following:

The lofty mountain zones of Peru, the high bordering valleys, and the belts of rolling plateau between are occupied by a race of shepherds. In that cold, inhospitable region at the top of the country are the highest permanent habitations in the world (17,100 feet), the loftiest pastures, the greatest degree of adaptation to combined

Courtesy of The Geographical Review.

TERRACED HILL SLOPES NEAR SALAMANCA, PERU.

"The floor and slopes of the valley are more completely terraced than in any other valley I know of. In the photograph, which shows at least 2,500 feet of descent near the town, one can not find a single patch of surface that is not under cultivation. The valley is simply filled with people to the limit of capacity." (From "The Country of the Shepherds," by Prof. Isaiah Bowman, in the Geographical Review for June, 1916.)

altitude and frost. It is here only a step from Greenland to Arcady. Nevertheless it is Greenland that has the people. Why do they shun Arcady? To the traveler from the highlands the fertile valleys between 5,000 and 8,000 feet seem like the abode of friendly spirits to whose charms the highland dweller must yield. Every pack train from valley to highland carries luxury in the form of fruit, coca, cacao, and sugar. One would think that every importation of valley products would be followed by a wave of migration from highland to valley. On the contrary, the highland people have clung to their lofty pastures for unnumbered centuries. Until the conquest the last outposts of the Incas toward the east were the grassy ridges that terminate a few thousand feet below the timber line.

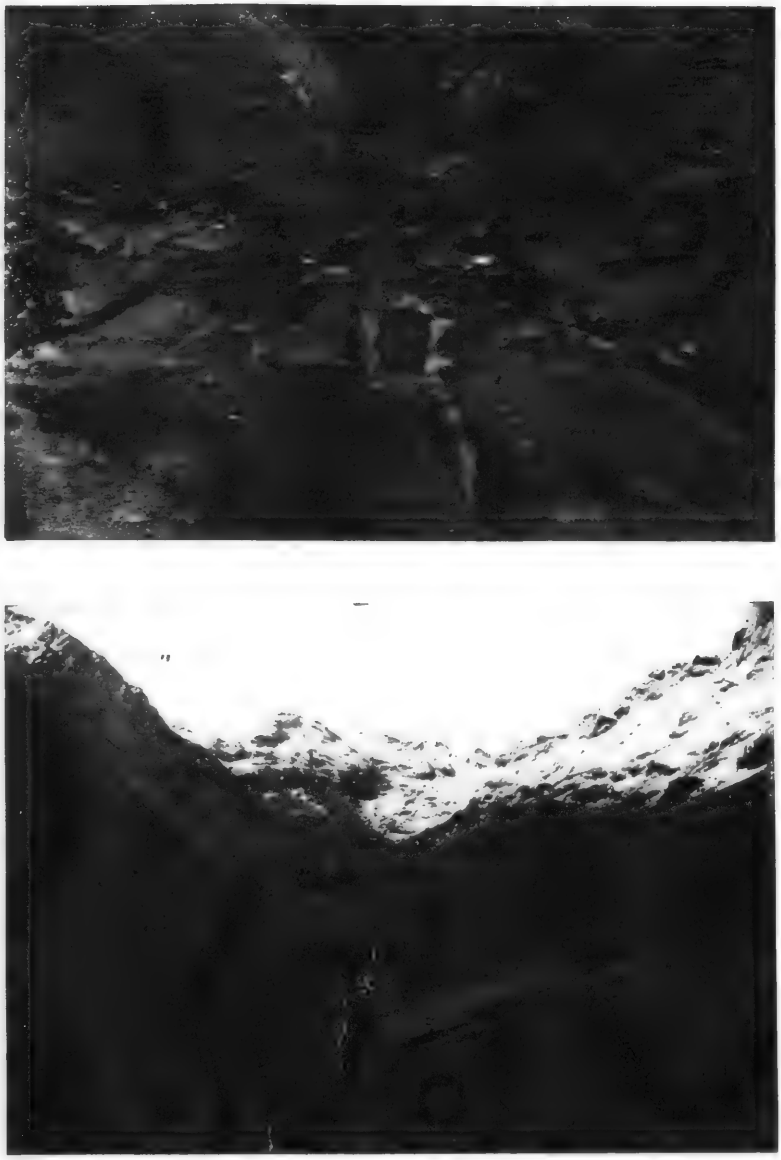
In this natural grouping of the people where does choice or blind prejudice or instinct leave off? Where does necessity begin? There are answers to most of these questions to be found in the broad field of geographic comparison. But before we begin comparisons we must study the individual facts upon which they rest. These facts are of almost every conceivable variety. They range in importance from a humble shepherd's stone corral on a mountain slope to a thickly settled mountain basin. Their interpretation is to be sought now in the soil of rich playa lands, now in the fixed climatic zones and rugged relief of deeply dissected, lofty highlands in the Tropics. Some of the controlling factors are historical, others economic; still other factors have exerted their influence through obscure psychologic channels almost impossible to trace. The *why* of man's distribution over the earth is one of the most complicated problems in natural science, and the solution of it is the chief problem of the modern geographer. * * *

In analyzing the facts of distribution we shall do well to begin with the causes and effects of migration. Primitive man is in no small degree a wanderer. His small resources often require him to explore large tracts. As population increases the food quest becomes more intense, and thus there come about repeated emigrations which increase the food supply, extend its variety, and draw the pioneers at last into contact with neighboring groups. The farther back we go in the history of the race the clearer it becomes that migrations lie at the root of much of human development. The raid for plunder, women, food, beasts, is a persistent feature of the life of those primitive men who live on the border of unlike regions.

The shepherd of the highland and the forest hunter of the plains perforce range over vast tracts, and each brings back to the home group news that confirms the tribal choice of habitation or sets it in motion toward a more desirable place. Superstitions may lead to flight akin to migration. Epidemics may be interpreted as the work of a malignant spirit from which men must flee. War may drive a defeated group into the fastnesses of a mountain forest where pursuit by stream or trail weakens the pursuer and confines his action, thereby limiting his power. Floods may come and destroy the cultivated spots. Want or mere desire in a hundred forms may lead to movement.

Even among forest tribes long stationary the facile canoe and the light household necessities may easily enable trivial causes to develop the spirit of restlessness. Pressure of population is a powerful but not a general cause of movement. It may affect the settled groups of the desert oases, or the dense population of fertile plains that are rooted in the soil. On the other hand, mere whims may start a nomadic group toward a new goal. Often the goal is elusive and the tribe turns back to the old haunts or perishes in the shock of unexpected conflict.

In the case of both primitive societies and those of a higher order the causes and the results of migration are often contradictory. These will depend on the state of civilization and the extremes of circumstance. When the desert blooms the farmers of the Piura Valley in northwestern Peru turn shepherd and drive their flocks of sheep and goats out into the short-lived pastures of the great pampa on the west. In dry years they send them eastward into the mountains. The forest Indian of the lower Urubamba is a fisherman while the river is low and lives in a reed hut beside his culti-



Courtesy of The Geographical Review.

SCENES IN "THE COUNTRY OF THE SHEPHERDS."

Upper: "Village at head of alluvial fan near Lambrama. This relation of town to alluvial fan is typical of a large part of the Peruvian Andes. Above are the mountain pastures; below are the better farms of the valley and basin planters. Elevation, 10,600 feet." Lower: "Looking up a spurless flat-floored glacial trough near the pass in the Cordillera Vilcapampa from 14,200 feet. Note the looped terminal and lateral moraines on the steep valley wall on the left. A stone fence from wall to wall serves to inclose the flock of the mountain shepherd."

vated patch of cane and yuca. When the floods come he is driven to the higher ground in the hills where he has another cultivated patch of land and a rude shelter. To be sure, these are seasonal migrations, yet through them the country becomes better known to each new generation of men. And each generation supplies its pioneers, who drift into the remoter places where population is scarce or wanting altogether.

As an instance of migration to an apparently extremely inhospitable region Prof. Bowman cites the following:

The loftiest habitation in the world is in Peru. Between Antabamba and Cotahuasi occur the highest passes in the Maritime Cordillera. We crossed at 17,400 feet, and 300 feet lower is the last outpost of the Indian shepherds. The snow line, very steeply canted away from the sun, is between 17,200 and 17,600 feet. At frequent intervals during the three months of winter, snowfalls during the night and terrific hailstorms in the late afternoon drive both shepherds and flocks to the shelter of leeward slopes or steep canyon walls. At our six camps, between 16,000 and 17,200 feet, in September, 1911, the minimum temperature ranged from 4° to 20° F. The thatched stone hut that we passed at 17,100 feet, and that enjoys the distinction of being the highest in the world, was in other respects the same as the thousands of others in the same region. It sheltered a family of five. As we passed, three rosy-cheeked children almost as fat as the sheep about them were sitting on the ground in a corner of the corral playing with balls of wool. Hundreds of alpacas and sheep grazed on the hill slopes and valley floor, and their tracks showed plainly that they were frequently driven up to the snow line in those valleys where a trickle of water supported a band of pasture. Less than a hundred feet below them were other huts and flocks.

Here we have the limits of altitude and the limits of resources. The intervalley spaces do not support grass. Some of them are quite bare, others are covered with mosses. It is too high for even the tola bush—that pioneer of alpine vegetation in the Andes. The distance to Cotahuasi is 75 miles, to Antabamba 50 miles. Thence wool must be shipped by muleback to the railroad, in the one case 250 miles to Arequipa, in the other case 200 miles to Cuzco. Even the potatoes and barley, which must be imported, come from valleys several days' journey away. The question naturally arises why these people live on the rim of the world. Did they seek out these neglected pastures, or were they driven to them? Do they live here by choice or of necessity?

It is these questions that Prof. Bowman answers in 38 pages of interesting text and elucidating diagrams and illustrations.

The Oldest Dated American Monument—A Nephrite Figurine from Mexico, is the subject of a most interesting sketch by Dr. W. H. Holmes in the May number of Art and Archæology (Washington, D. C.). The little figurine described is only about 6½ inches in height and 3¾ inches in diameter at its base, and yet, according to Dr. Holmes, it "has come to be regarded as the most interesting and precious of the minor relics of antiquity." It seems that it was plowed up in 1903 by a peon in the district of San Andres, Tuxtla, Mexico, and is now to be found in the United States National Museum at Washington. Descriptions of the various features of the figurine will be found in the legends under the accompanying illustrations. While the design and sculptural excellence of this ancient relic are of interest as indicating the cultural status of its producers, its chief value lies in the glyphs which are engraved on its back, sides, and

Courtesy of Art and Archaeology (Washington, D. C.).

THE OLDEST DATED AMERICAN MONUMENT.

This remarkable little jade figurine is to be found in the archæological collection of the New National Museum at Washington, D. C., and is described by Dr. Holmes as follows: "It is composed of very hard grayish-green stone, a variety of nephrite or jade, and is about 6½ inches in height and 3⅜ inches in diameter at the base. * * * The upper part presents a human head with somewhat pointed bald crown and well-defined though not elaborately carved features. The lower part of the face is covered with a mask-like device, in appearance resembling the bill of a duck or other water bird, carved in relief and extending down over the chest like a beard. The cheeks are overlaid by a conventional design in relief which lends a genial expression to the face, and discoidal ornaments are affixed to the ears. The idea of a cassock or other loose garment is destroyed when the figure is examined closely, for the bird form is further emphasized by wings covering the sides of the figure, the lower margins of which are carved to represent feathers. Beneath the wings the bird's legs and feet appear engraved in outline."

front. The full significance of this feature is brought out by Dr. Holmes as follows:

The specimen derives special value from its chronological significance, although its value as an index of culture status is not to be overlooked. The problems of chronology are among the most important that present themselves for solution to the historian of man in America. The historic period, the period of written history as commonly conceived, begins with the Columbian discovery, although as far back as the year 1000 there occurs an isolated page of written history, the story of the Norsemen, which, however, is not fraught with particular interest to students of the aborigines. The long period antedating the arrival of Columbus is illumined by traditions which carry our knowledge of native affairs back a little way into the shadows. The fossil remains of man and the crumbling remains of his handiwork, although nonpurposeful as records, are even more illuminating, and their study by the palæontologist and the archæologist is little by little solving the riddle of the prehistoric American.

The written history of America is not confined, however, exclusively to the Old World system of writing, for it is gradually dawning on our minds that the early Americans were a literary people and were perfecting a method of giving permanent form to their interesting history, philosophy, and poetry. Our students are making haste to interpret the many inscriptions which are found sculptured on monuments and embodied in the books that have been preserved to our time. It is found that these writings are not merely pictographic and thus intelligible to students of a strange race only so far as the pictures tell the story, but are phonetic in part, and students are encouraged to believe that an elementary alphabet may yet be found.

There is another phase of these records which offers no little promise to the patient delver into the hidden places of history. The old texts are found to be largely calendric, and the glyphic symbols for days, months, and cycles are well determined and the dates of sculptured monuments and architectural remains are being read. The skeleton of aboriginal history is thus carried back thousands of years. The exceptional interest centering in this little image is due to the fact that, as read by Mr. Morley, its inscriptions embody the earliest date yet determined in America, a date which corresponds to 100 years before the birth of Christ in our system of chronology. Next to this in antiquity is a small tablet or slab of jade, known as the Leyden stone, the date of which is 160 years later.

Courtesy of Art and Archæology.

THE MAYAN DATE ON THE TUXTLA FIGURINE.

The date, as it appears on the front of the statuette, according to Morley, consists of an introductory glyph at the top and a series of counters which, interpreted according to the system that has been perfected by long and painstaking researches by a score of students, give the date 100 B. C.

According to inscriptions carved on monuments in Guatemala and Honduras, the ancient cities of the southern Maya area had their greatest development between 200 and 500 years after Christ, while the more northerly centers yield dates coming down to within a few hundred years of the landing of Columbus. These gratifying forward steps in this fascinating field of research are being followed up vigorously by Mr. Morley, who, under the liberal patronage of the Carnegie Institution, of Washington,

Courtesy of Art and Archæology (Washington, D. C.)

SIDES AND BACK OF "THE OLDEST DATED AMERICAN MONUMENT."

"The several lines of glyphs on the sides and back of the image can not as yet be read, but they doubtless relate to events of the period recorded on the front of the figure. A chief point of interest in this work is that it establishes the important fact that 20 centuries ago the native peoples of the Vera Cruz region had risen to the stage of culture advancement which is characterized by the invention of writing, the particular step that best marks the transition from barbarism to civilization—a very high stage indeed for a people still within the confines of the stone age." (Dr. W. H. Holmes in Art and Archæology for May, 1916.)

is now pursuing his studies in regions in which only those who are prepared to endure hardships and encounter dangers should venture.

The Tuxtla statuette is the work of an advanced people once occupying the eastern shores of Mexico. It is therefore surmised, since its glyphs belong to the Mayan system rather than to the Aztec, that in earlier centuries the Mayan dominion extended over the territory now the State of Vera Cruz, and, further, that possibly the Huastecan Tribe now occupying parts of the region is a remnant of the Maya race.

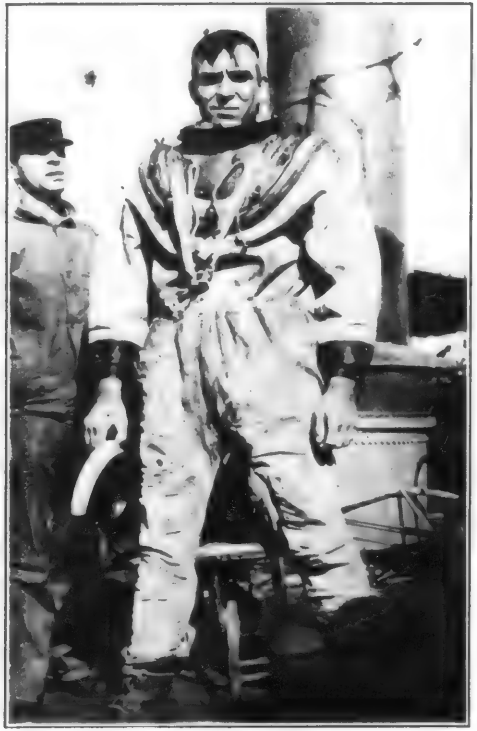
The date, as it appears on the front of the statuette, is shown in the accompanying figure. According to Morley this consists of an introductory glyph at the top, and a series of counters which, interpreted according to the system that has been perfected by long and painstaking researches by a score of students, give the date already mentioned. The several lines of glyphs on the sides and back of the image can not as yet be read, but they doubtless relate to events of the period recorded on the front of the figure.

A chief point of interest in this work is that it establishes the important fact that 20 centuries ago the native peoples of the Vera Cruz region had risen to the stage of culture advancement which is characterized by the invention of writing, the particular step that best marks the transition from barbarism to civilization—a very high stage indeed for a people still within the confines of the stone age. It may be added that the state of culture indicated by this specimen could not have been reached in a brief period, assuming a reasonable rate of development from the most primitive known stage of advancement in America. The time intervening between the stage of simple hunter-fisher culture to the invention of an alphabet may better be reckoned in thousands than in hundreds of years. The exact chronological value of the image can never be known, but the record it bears gives countenance to the view that America has been occupied by the race far back toward the retreat of the glacial ice from the northern border of the United States 5,000 or more years ago.

Improvements in Deep-Sea Diving, in the current number of the Spanish edition of the BULLETIN, is an article which deals with the recent progress in deep-sea diving, due largely to the experiments and tests conducted under the auspices of the Bureau of Construction and Repair of the Department of the Navy of the United States. The following is the English version:

Two companies have recently been organized in the United States for rather an unusual purpose. The purpose is to finance operations which are to take place in the depths of the sea, operations which it is hoped by those instrumental in organizing the companies will result in the recovery from the bottom of oceans of much of the wealth that has been lost in remote as well as in recent times by the sinking of ships. One of these companies is called the "Inter-Ocean Submarine Engineering Co.," while the other bears the name of the "Deep Sea Salvage Corporation." From accounts in the daily press it would seem that men of large capital are interested in both enterprises, and if the projects fail to attain their end it will not be because of lack of financial backing.

Certain it is that the project of recovering sunken ships, or the most valuable of the treasures that have gone down with them, is more feasible now than it was only four or five years ago. Such great improvements in diving apparatus have recently been made



Courtesy of the Washington Star.

DEEP-SEA DIVING IN THE UNITED STATES NAVY.

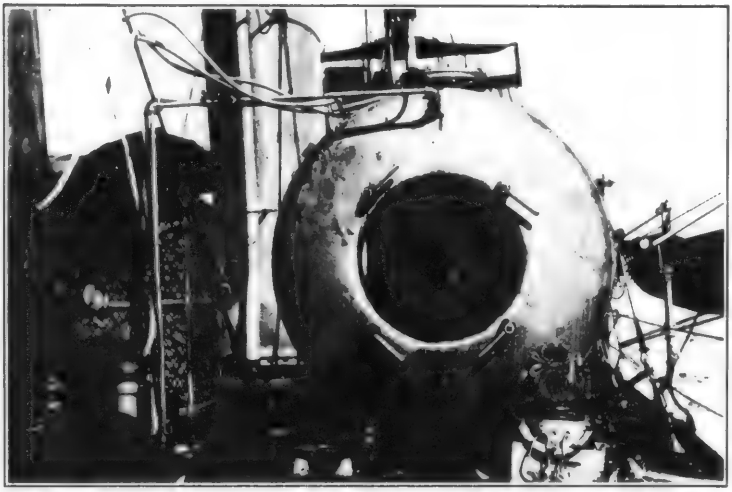
During the deep-sea diving experiments made by the divers of the United States Navy in Long Island Sound in the latter part of 1914, Diver Drellishak reached the bottom at a depth of 274 feet. He remained there long enough to gather some pebbles and a coral-incrusted rock, and then ascended unaided, consuming 1 hour and 20 minutes in making the ascent, and with no ill effects. The photograph to the left shows him emerging from the water unaided; the one to the right was taken immediately after he had reached the deck of the *Walke*, having broken all previous deep-sea diving records.

that it is now possible for a diver to operate for a limited time even at the great depth of 300 feet below the surface. These improvements are largely due to the remarkable experiments in deep-sea diving conducted under the auspices of the United States Navy and which were not concluded until the later part of 1914. Prior to this time the greatest depth reached by divers was 210 feet. During a series of tests carried on by the British Admiralty in 1907 two English officers succeeded in reaching that depth. For the benefit of those who do not appreciate the difficulties of diving to a depth of 300 feet, it may be stated that at a depth of 10 feet below the surface the pressure is 4.33 pounds per square inch of surface of the body submerged. This pressure increases proportionately and at a depth of 100 feet it has increased to 43.3 pounds, and at a depth of 300 feet the pressure on every square inch of the diver's body is 129.9 pounds.

Notwithstanding this tremendous pressure, the expert divers of the United States Navy have succeeded in not only reaching a depth of 300 to 305 feet, but in remaining at that depth for varying intervals of from 5 to 20 minutes at a time, making examinations and observations in regard to a sunken vessel that made its subsequent salvage possible. This work was done in connection with the raising of the United States submarine *F–4*, which, it will be remembered, plunged to the bottom of the sea just off the harbor of Honolulu on March 25, 1915. Not only did the divers establish a new world's record for deep-sea diving upon the occasion, but the subsequent raising and recovery of the *F–4* is the only instance in history where a sunken vessel was recovered from a depth of 300 feet. And the success of the undertaking is attributable to the experimental work of the Navy.

In order to understand recent improvements in diving appliances a very brief sketch of diving as a useful art may not be amiss. That diving for utilitarian purposes is an ancient activity may be gleaned from a reference in the Iliad, where Patroclus compares the fall of Hector's charioteer to the action of a diver diving for oysters—showing that the art was known perhaps a thousand years before the Christian Era. Thucydides mentions the employment of divers during the siege of Syracuse to saw down certain barriers which had been erected below the surface of the water as a protection of the city against the invading fleets. Again, at the siege of Tyre Alexander the Great ordered divers to destroy the submarine defenses of the besieged. The employment of divers for the salvage of sunken property is first mentioned by Livy, who records that in the reign of Perseus considerable treasure was recovered from the sea in this manner.

In these references, however, there is nothing to indicate that the divers were assisted by any mechanical appliances or devices de-



Courtesy of the Washington Star.

RECENT IMPROVEMENTS IN DEEP-SEA DIVING APPARATUS.

Top picture: The recompression chamber on the deck of the U. S. S. *Walke*. When a diver meets with some accident and is compelled to ascend to the surface too rapidly, he is placed in this chamber and subjected to a pressure corresponding to that of the deep water from which he has emerged and is then decompressed gradually and restored to his normal condition, the illness known as "caisson disease" being thus avoided. Bottom picture: Talking to a diver by means of the newly improved telephone used in the United States Navy.

signed to furnish them air while under water. The earliest mention of any such appliances is by Aristotle, who says that divers are sometimes provided with instruments for respiration through which they can draw air from above the water and which thus enables them to remain a long time under the sea, and also that divers breathe by letting down a metallic vessel which does not get filled with water but retains the air within it. It is also recorded that Alexander the Great made a descent into the sea in a machine called a *colimpha*, which had the power of keeping a man dry and at the same time of admitting light and presumably air. Pliny also speaks of divers engaged in the strategy of ancient warfare, who drew air through a tube, one end of which they carried in their mouths while the other end was made to float on the surface of the water. A record of more recent date is to be found in the British Museum in a 1532 edition of Vegetius's De Re Militari, in which is an engraving representing a diver wearing a tight-fitting helmet to which is attached a long leather pipe or hose leading to the surface, where its open end is kept afloat by means of a bladder.

It is needless to enumerate the various modifications of these appliances which were invented from time to time, all of which were necessarily lacking in efficiency until the advent of the air-force pump and vulcanized rubber. In 1819 Augustus Siebe, founder of the English firm of Siebe, Gorman & Co., devised what he called his "open" diving dress. This consisted of a metal helmet and shoulder plate attached to a water-tight jacket, under which, fitting more closely to the body, was worn a combination suit reaching to the armpits. The helmet was fitted with an air-inlet valve, to which one end of a flexible tube was attached, the other end being connected at the surface with a pump which supplied the diver with a constant stream of fresh air. The air, which kept the water well down, forced its way between the jacket and the undergarment, and escaped to the surface on exactly the same principle as that of the diving bell; hence the term "open" dress. The objection to this appliance was that the diver had to always maintain an erect position under water; if he stumbled and fell or even stooped the water filled his dress, and he was in danger of drowning unless quickly brought to the surface. After many experiments Siebe finally, in 1830, perfected his "close" dress in combination with a helmet fitted with air inlet and regulating outlet valves.

It was not until the elasticity and imperviousness to water of vulcanized rubber became known that the modern diving apparatus became possible. This apparatus now consists essentially of an air pump, a helmet with breastplate, a diving dress, a pair of heavily weighted boots, a pair of back and chest weights, and a flexible non-collapsible air tube; also a guiding or life line. Whenever feasible a tank or cylinder of compressed air is used to supply the diver with

Courtesy of the Washington Star.

DEEP-SEA DIVER OF THE UNITED STATES NAVY.

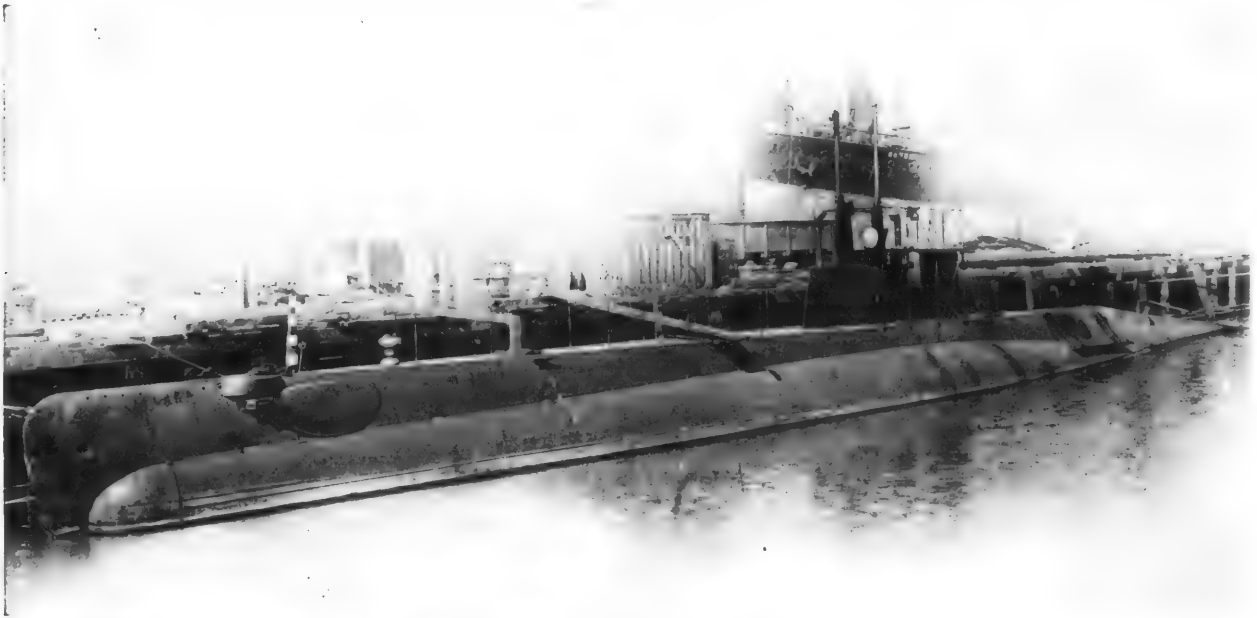
In the picture the diver is indicating with his left hand the location of the air-control valve in the breastplate of the diving suit. Formerly the compressed air was forced down to the diver by means of hand pumps and the supply controlled at the surface, thus necessitating the diver's signaling for the required amount at varying depths. In the new method the air hose is connected with a tank or cylinder of compressed air and the diver ,by means of this valve ,controls the supply himself.

the needed air, a recent invention of an inlet valve in the breastplate of the diver enabling him to control the supply, instead of the control being at the surface, as was formerly the case.

The helmet and breastplate are made from highly planished tinned copper, with gun-metal valves and other fittings. The helmet is provided with a nonreturn air-inlet valve to which the diver's air tube is connected; the air when it lifts the inlet valve passes into the helmet through three conduits—one having its outlet over the front glass, the others their outlets over the side glasses. In this way the diver gets the fresh air as it enters the helmet, and at the same time it prevents condensation of his breath on the glasses and keeps them clear. There is a regulating air-outlet valve by which the diver adjusts his supply of air according to his requirements in different depths of water. By unscrewing the valve the diver allows air to escape, and thus the dress is deflated; by screwing it up the air is retained and the dress inflated. Thus the diver can control his specific gravity and rise or sink at will. An emergency cock is provided so that he can quickly rid himself of superfluous air in case of need. The helmet is provided with plate glasses in front and on each side to enable the diver to see in three directions. The breastplate attached to the helmet is fitted on its outer edge with metal screws and bands, so arranged that the screws correspond with the holes in the india-rubber collar of the diving dress. This dress is a combination suit which envelopes the whole person from feet to neck. It is made of two layers of twilled cloth with pure rubber between, and is fitted at the neck with a vulcanized-rubber collar, or band, with holes punched in it corresponding to the screws in the breastplate. This collar, when clamped tightly between the bands and the breastplate by means of the nuts, insures a water-tight joint.

The heavily weighted boots and the weights of about 40 pounds each that the diver carries on his back and chest ensure his equilibrium when under water. One of the most recent adjuncts to the modern diving apparatus is the telephonic contrivance which enables him to keep in constant communication with the assistants at the surface, a description of which is not necessary for the purpose of this sketch.

As may be deduced from the above description of the diving apparatus, the diver into deep water is subjected to two pressures, viz, the pressure of the air inside the helmet and suit and the external pressure of the water. As he descends the external pressure of the water increases at the rate of 4.33 pounds per square inch of surface for every 10 feet of descent. When he goes under water any air with which his dress is inflated is driven out through the outlet valve in the helmet by the pressure of the water, so that the dress becomes closely applied to his legs, body, and arms, up to the corselet, or collar, where the dress is joined to the rigid breastplate and helmet. If the valve



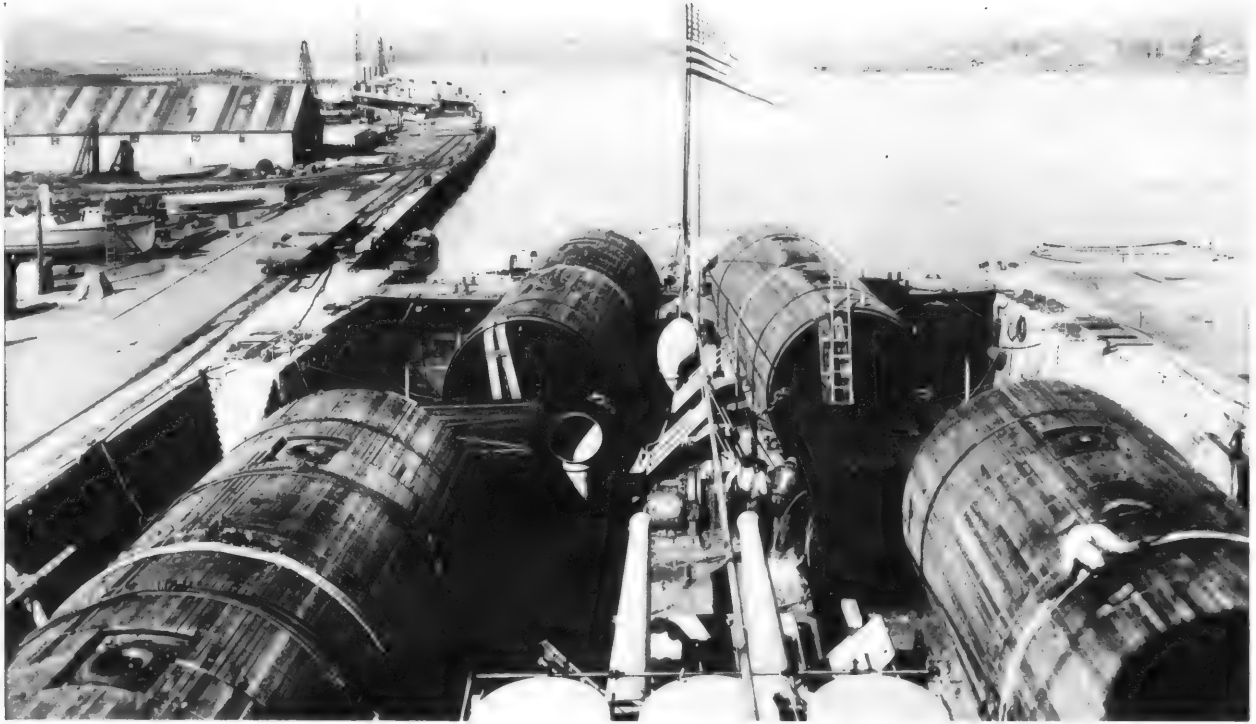
Courtesy of Bureau of Construction and Repair, Navy Department.

THE UNITED STATES SUBMARINE "F-4."

The *F-4*, completed in 1913 and in commission since May 3 of that year, sank beneath the waves off the harbor of Honolulu on the morning of March 25, 1915. Failing to return when expected, the naval authorities at that station at once made efforts to locate her and to attempt to effect a rescue. The vessel was found lying at the bottom of the sea at a depth of about 300 feet. The enormous pressure of the water at that depth, added to the weight of the water which filled her, was such that the strongest lifting lines obtainable were broken in the effort to raise her. The disaster resulted in the death of the lieutenant commanding the vessel and the crew of 20 men. Expert deep-sea divers of the Navy were sent from New York, special lifting apparatus was devised by naval constructors, and the vessel was recovered, with the bodies of the drowned men, some months later. Never before has a vessel been recovered from such a depth.

were kept screwed up so that the dress remained inflated under water, he would not be able to get down. The consequence of the collapse of the dress is that the pressure of the water on all parts of the body below the helmet is greater than the pressure of the air in the helmet. If the valve is freely open, the excess of pressure on any part of the body will be equal to that of a column of water the height of the valve outlet above this part. Thus the external pressure on the chest at the nipple will be about 1 foot of water, or 70 pounds per square foot, above the pressure in the helmet. As the pressure in the lungs is that of the helmet, the diver will have to expand his lungs against this excess pressure, and it is this which so greatly hampers his breathing. In ascending the diver screws up the outlet valve and the constant inflow of the compressed air increases the air pressure in the dress, and when this exceeds the water pressure on the outside the dress inflates and causes him to rise.

The necessity of having the air pressure within the diving dress compensate the external water pressure, thus subjecting the diver to pressures directly proportioned to the depth to which he descends, is the dangerous element in deep-sea diving. At a depth, for instance, of 100 feet, a diver must be subjected to a pressure of 4 atmospheres, or 60 pounds per square inch, in order to compensate the external water pressure of 43.3 pounds per square inch. Exposure to such pressures is apt to be followed by dangerous physiological effects, commonly known as "caisson disease," the symptoms of which include pains in the muscles and joints, commonly called the "bends," deafness, embarrassed breathing, vomiting, fainting, and sometimes resulting in death. They do not appear during the time that the pressure is being raised nor so long as it is continued, but only after it has been removed; and the view now generally accepted is that they are due to the rapid effervescence of the gases which are absorbed in the body fluids during exposure to pressure. Experiment has proved that in animals exposed to compressed air nitrogen is dissolved in the fluids to the extent of about 1 per cent for each atmosphere of pressure, and also that when the pressure is suddenly relieved the gas is liberated in bubbles within the body. It is these bubbles that do the harm. Set free in the spinal cord, for instance, they may give rise to partial paralysis, or in the heart lead to stoppage of the circulation; again, they may be liberated in parts where they do no harm. It has been found, however, that if the pressure is relieved gradually the bubbles are not formed, because the gas comes out of solution slowly and is got rid of by the heart and lungs. To prevent these dangerous effects, therefore, the withdrawal of the air pressure—in other words, the decompression—should be slow. Hence the diver's ascent must be regulated accordingly, and the deeper he has been the slower and longer must be the periods for decompression. It was particularly in regard to the matter of decompression that the experiments and tests



Courtesy of Bureau of Construction and Repair, Navy Department.

THE PONTOON CYLINDERS ON BOARD THE U. S. S. MARYLAND.

The final salvage of the *F-4* was accomplished by means of six great pontoon cylinders, devised by Naval Constructor Furer and constructed at the United States Navy Yard at Mare Island, Cal. These cylinders, 32 feet long and from 11 to 12½ feet in diameter, were sunk in pairs on each side of the submerged vessel, to which they were attached by great steel chains, and when the water was expelled from them by means of compressed air their tremendous lifting power of 420 tons was exerted and the *F-4* easily brought to the surface.

of the United States Navy Department in 1914 led to improved methods, so that a depth of 300 feet can now be reached with safety by an expert diver. The work was done under the auspices of the Bureau of Construction and Repair, under the supervision of Chief Gunner George D. Stillson, whose detailed report on the work, issued in 1915, is the latest word on the subject.

A company whose business is the manufacture of diving apparatus offered the use of a high-pressure tank in their factory at Brooklyn, N. Y., for the purpose of making the so-called laboratory experiments, the tank being converted into an experimental diving station for the time being. The significance of these experiments will be better understood when it is explained that in the tank equivalent depths were obtained by putting air pressure on the surface of the water in the tank, so constructed that compressed air could be admitted to the space between the water and the air-tight top. Thus with very little water, comparatively speaking, they were enabled to reach a pressure corresponding to vastly greater depths. The maximum working pressure of the tank was about 100 pounds, and diving was regularly carried on under this pressure, which corresponds to a depth of over 200 feet in the water of the ocean. During these experiments the divers were constantly under observation by the surgeon and others on the outside who could look through glass-covered portholes in the tank. Various tests of diving apparatus of all kinds were made, new forms of diving helmets, suits, telephones, etc., were tried and experimented with, but perhaps the most important results obtained were in regard to the time of the periods of decompression required to restore the diver to his normal condition after submersion under great pressure.

The tests in the tank were subsequently supplemented by a series of experiments of diving in water of actually great depths. The torpedo-boat destroyer *Walke* was placed at the disposal of the experimenters and was equipped with the necessary apparatus and the tests were made in Long Island Sound. The data obtained from the experiments in the tank were verified, and one diver descended to the bottom of the sea to a depth of 274 feet, remained there for several minutes, collected a quantity of pebbles and a small rock covered with coral growth, and after being under water for 1 hour and 32 minutes emerged safely and without any ill effects whatever. The time consumed in raising him from the bottom and accomplishing the gradual decompression consumed 1 hour and 20 minutes. When the *F-4* sank near Honolulu the same expert divers who had conducted these experiments were sent to that station, where the still greater depth of over 300 feet was reached in the work of recovering that vessel.

During the prosecution of this work an accident occured which has great significance. One of the divers—Loughman by name—had

descended to the bottom, and upon attempting to return found that his apparatus had become entangled in such a manner that he was unable to rise higher than 250 feet below the surface. After returning to the bottom he again made the attempt to ascend, but was again stopped at 250 feet. Another diver was sent to his rescue, and he was finally liberated and brought to the surface after he had been submerged for four and a half hours. During this submersion he had been held at a depth of from 250 to 300 feet for 3 hours and 40 minutes. Upon returning to the surface he was at once placed in a compression chamber and again placed under a pressure corresponding to that he had endured, and gradually decompressed. He was very ill for some time afterward, but finally recovered, thus demonstrating the fact that a man can remain at these extreme depths for a long period and with proper means of decompression be restored to a normal condition. Such long-continued submersion, however, is very dangerous and would no doubt result in death in most cases.

The fact that a diver can descend to such depths and direct submarine work makes possible the salvage of ships and treasures that have lain at the bottom of the sea for many years, for many of these are in water that is no deeper. Among such may be mentioned the *Merida*, sunk in collision with the *Admiral Farragut* east of Cape Charles in 300 feet of water, having a cargo of $500,000 in silver bars, $300,000 in gold, and perhaps $200,000 worth of valuables in purser's safe; the *Lusitania*, torpedoed May 7, 1915, 12 miles south of Kinsale, Ireland, in 270 feet of water, carrying at least $1,000,000 in gold and jewelry and several millions in securities; the *Oceana*, sunk off Beachy Head, March 16, 1912, with $5,000,000 in gold and silver, part of a Chinese loan; the *Islander*, sunk in 320 feet of water near Juneau, Alaska, with $2,000,000 in gold; the *General Grant*, wrecked on coast of Auckland Islands in 1866, in 80 feet of water, carrying $15,000,000 in gold bars and bullion; the flagship *Florentia*, lost in Tobermory Bay, off the west coast of Scotland, with $15,000,000. Among the more ancient wrecks which carried treasure may be recalled the Spanish galleon *Santa Margarita*, which, in 1597 sailed from Santo Domingo with $7,000,000 on board and was wrecked in Mona Passage near Porto Rico; also the famed fleet of 17 Spanish galleons, loaded with treasure worth $140,000,000, collected in South America and the West Indies, attacked by the Dutch and English fleets in Vigo Bay, Spain, and sunk by the Spaniards to prevent their falling into the hands of their enemies. It is said that 6 of these were subsequently raised and about $20,000,000 recovered, but the others, with their $120,000,000 of treasure, still lie at the bottom of the bay. In view of the recent accomplishments of the divers of the United States Navy, may not the dream of recovering much of this lost treasure become a reality?

BOOK NOTES

The Rubber Industry of the Amazon. Based on the experiences of Joseph F. Woodroffe, edited by Harold Hamel Smith, editor of Tropical Life. John Bale, Sons & Danielsson (Ltd.), London. 1915. 435 pages.

The foreword to this most interesting and important volume is contributed by the Right Hon. Viscount Bryce, a fact tending to indicate the seriousness with which the book deals with the problem of rubber extraction.

The main purpose of the volume is to show how the supremacy of the rubber industry of the Amazon can be maintained and consolidated in spite of the increasing competition to which it has lately been subjected by its Eastern rival. Furthermore, it tells how Brazilian rubber jungles may be exploited without harming English investments in Ceylon, Malaya, and other parts of the world. According to the book, neither must nor will suffer, and this is as it should be, for while it is unthinkable that plantation rubber should decrease it is equally impossible for England to allow her investments in Brazil, amounting to more than a billion and a half dollars, to lapse into inactivity.

For the man of commerce, the tourist, or the traveler in general, the book offers much interesting reading, as it brings to light many phases of life and conditions in a section of the world just now being investigated more thoroughly than ever before.

Latin-American Opportunities for the South.

This is an interesting semimonthly booklet carrying much general information on Latin American topics. It is edited by Mr. Charles Lyon Chandler, formerly of the United States consular service, but who now holds the position of South American agent of the Southern Railway and allied lines, with headquarters in Chattanooga, Tenn. Mr. Chandler's long residence in South America, coupled with his extensive investigations in various parts of the continent, especially qualify him for the work recently undertaken. The publication contains 16 pages and is filled with live matter eminently suited to the manufacturer who is cultivating Latin American markets.

Railway Expansion in Latin America. By Frederick M. Halsey. Moody Magazine & Book Co., New York. 1916. 171 pages. Price, $1.50.

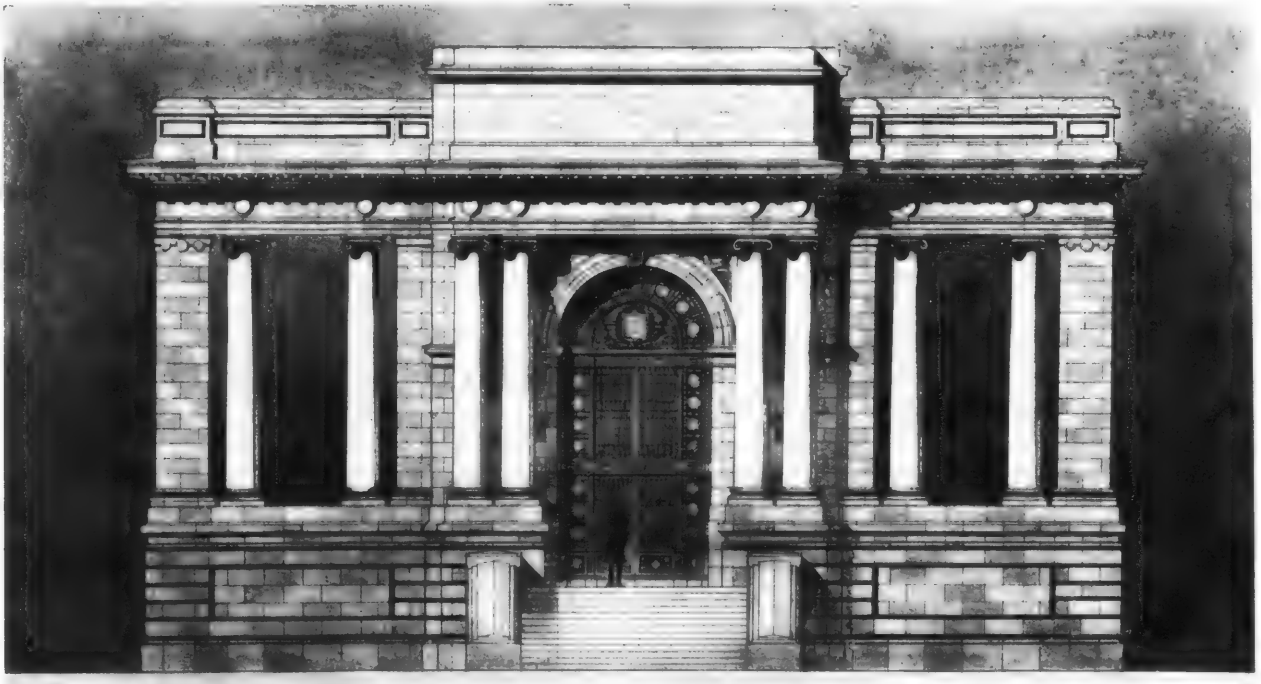
This little work is the outgrowth of a series of articles contributed by the author to a popular magazine during the years 1914 and 1915. It might be termed a companion volume to one of a somewhat similar nature written by Mr. Halsey and published a few years ago.

The present book considers the progress of railways in each of the countries of Latin America, and voices the writer's opinion that in the future there will be far more capital from the United States seking profitable ventures in Latin America than ever before. The railway mileage of each Republic, the earnings, proposed lines, distances, and many other important facts in connection with transportation, especially from the point of view of the capitalist, are weighed and considered.

The book will be of service to all persons interested in transportation and in dealing with the countries of which it treats. There are 41 illustrations and 4 maps.

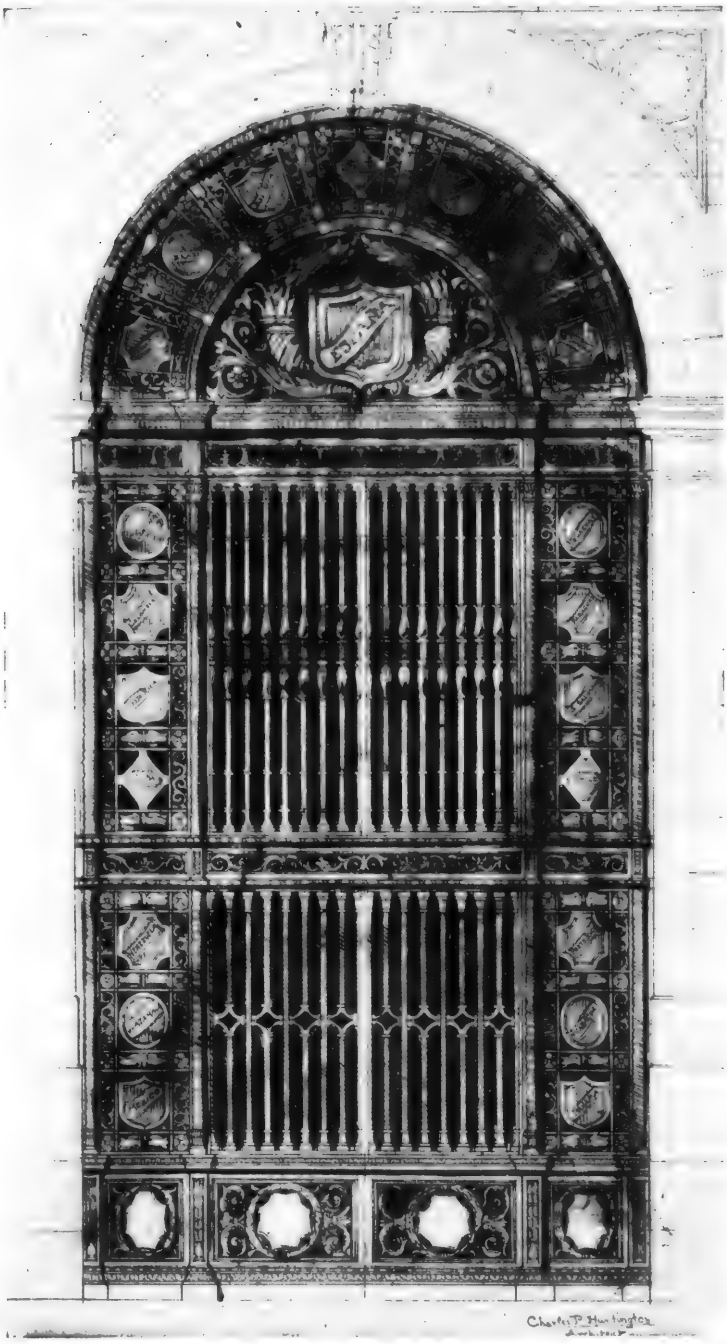
Argentine Railways. By Leopold Grahame. Renskorf, Lyon & Co., New York. 1916. 36 pages.

This is an interesting booklet or a general review of the Argentine railways, showing their position, conditions, and prospects. The matter was written by a former editor and proprietor of the Buenos Aires Herald, a fact that commends the booklet as being authoritative and reliable. Mr. Grahame resided for years in Argentina, and what he says is based on first-hand information. The short chapters on "Attraction of foreign



A MONUMENT TO CERVANTES IN NEW YORK.

The Hispanic Society of America (New York), of which Mr. Archer M. Huntington is the president and founder, has recently made provision for the erection of a magnificent marble and bronze monument to commemorate the life and work of Miguel de Cervantes Saavedra, the immortal author of Don Quixote. The monument is to be in the form of a massive portal and archway at the entrance of the inclosure of the society's fine home on Broadway and One hundred and fifty-sixth Street. The design is by Mr. Charles P. Huntington and in its general lines follows the beautiful examples of similar architecture of the Spanish renaissance period. The monument is to be 110 feet long and about 55 feet high in the central portion.



DOORWAY OF THE CERVANTES MONUMENT.

The central feature of the Cervantes monument to be erected in New York by the Hispanic Society of America consists of massive bronze doors, weighing 2 tons and having a height of 26 and a width of 12 feet. The elaborate ornamentation includes the escutcheon of Spain as the center of the crowning arch, while the shields of all the Spanish-speaking countries of the New World will be arranged as a complete border about the splendid portal.

capital" and "Protection of foreign interests" will appeal strongly to those who have funds available for investment in foreign countries. In 1895, according to the writer, about one billion dollars of foreign capital was invested in Argentina; at present the amount is approximately three times as much.

Chile To-day (Chile al Dia).

This is the title of a new publication which will be issued monthly in Santiago by Hume & Walker. The first edition contains about 15 large illustrations depicting Chilean life, customs, scenery, and activities. Under each picture there is descriptive matter in five leading languages, which fact places the publication on an equally interesting basis far beyond the boundaries of the country in which it originates. The new journal should be an important factor in making Chile better known to the world.

SUBJECT MATTER OF CONSULAR REPORTS

REPORTS RECEIVED UP TO JULY 1, 1916.[1]

Title.	Date.	Author.
ARGENTINA.	1916.	
Parcels post service	Jan. 18	W. Henry Robertson, consul general, Buenos Aires.
Classification of petroleum and products for customs tariff purposes.	Apr. 28	Do.
Argentine State Railways (report for 1915)	May 6	Do.
Annual report on commerce and industries for 1915	...do.....	William Dawson, jr., consul, Rosario.
Bulletin of foreign trade, 1913-1915	May 17	W. Henry Robertson, consul general, Buenos Aires.
BRAZIL.		
Drainage for city of Parahyba	May 5	A. T. Haeberle, consul, Pernambuco.
Commerce of Brazil for the first three months of 1916	May 15	A. L. M. Gottschalk, consul general, Rio de Janeiro.
Market for American marble and granite	...do.....	Do.
CHILE.		
Annual report on commerce and industries for 1915	Apr. 25	Thomas W. Voetter, consul, Antofagasta.
Customhouse returns during first quarter of 1916	May 1	L. J. Keena, consul general, Valparaiso.
Market for American marble and granite	May 2	Do.
COLOMBIA.		
Annual report on commerce and industries for 1915. (Cartagena).	May 25	Leonard Blake Modico, vice consul, Cartagena.
COSTA RICA.		
Annual report on commerce and industries, 1915. First section	Apr. 22	Samuel T. Lee, consul, San José.
Market for paper bags in Costa Rica	May 8	Do.
Annual report for 1915. Second section	May 15	Do.
Annual report for 1915. Second section	May 29	C. Donaldson, consul, Port Limon.
CUBA.		
Invention of new implement for cane cultivation	June 6	Henry M. Wolcott, consul, Havana.
Cuban mattresses	...do.....	P. Merrill Griffith, consul, Santiago.
ECUADOR.		
Law regulating insurance companies in Ecuador	May 4	Frederic W. Goding, consul general, Guayaquil.
Regulations for study and practice of dentistry	May 11	Do.
Call for bids for water supply for Tulcan	May 23	Do.

[1] This does not represent a complete list of the reports made by the consular officers in Latin America, but merely those that are supplied to the Pan American Union as likely to be of service to this organization.

Reports received up to July 1, 1916—Continued.

Title.	Date.	Author.
HAITI.		
Annual report for year ending December 31, 1915	1916. Jan. 20	M. Fontaine, consular agent Aux Cayes.
MEXICO.		
River transportation in State of Tabasco	May 13	Thomas D. Bowman, consul Frontera.
Exports of logwood from Frontera	...do....	Do.
PANAMA.		
Motor vehicles	May 12	A. G. Snyder, consul general, Panama.
Imports into Panama during January, 1916	May 18	Do.
Statistics of liquor business during 1914-15	May 19	Do.
PARAGUAY.		
Market for American marble and granite	...do....	Samuel Hamilton Wiley consul, Asuncion.
PERU.		
Increased Peruvian customs revenues	May 12	William W. Handley, consu general, Callao.
Introduction of modern typesetting machine	May 17	Do.
VENEZUELA.		
List of schools and colleges	May 19	Geo. K. Donald, consul Maracaibo.
Telephone company of Maracaibo	June 5	Do.
Beer production in district	June 6	Do.

ARGENTINE REPUBLIC

The Argentine Congress has ratified the election of Hipolito Irigoyen and Pelagio Luna as President and Vice President, respectively, whose term of office will begin on October 12, 1916. According to the Argentine constitution, the President and Vice President hold their offices during a term of six years, but neither can be reelected until after an intermission of a full term.——— The last NATIONAL CENSUS taken on June 1, 1914, according to figures published in La Nacion and La Prensa of May 23, 1916, daily newspapers of the Federal capital, shows that on June 1, 1914, the population of the Argentine Republic was 7,885,237 against 3,954,911 by the census of 1895, by comparing which it is seen that the population of the nation has doubled in the last 20 years. Of the 7,885,237 inhabitants of the country, 5,527,285 are Argentinians and 2,357,952 are foreigners. The population of the national Territories increased from 103,369 in 1895 to 358,738 in 1914.———In 1915, the SALES OF REAL PROPERTY in the States and Territories of the Argentine Republic aggregated 5,960,534 hectares, valued at 220,184,820 pesos Argentine currency (Argentine paper peso equals $0.43), which shows an increase of 5.07 per cent in area sold as compared with 1914. The

greatest increase in sales occurred in the Provinces of Mendoza, Santa Fe, and Buenos Aires. In the 10 years from 1906 to 1915 the sales of real property in the Argentine Republic aggregated 85,497,642 hectares, valued at 2,732,830,378 pesos paper.———With an increase of 11,300,551 gold pesos during the first five months of 1916, the total GOLD RESERVE held on May 1, 1916, in the conversion office and Argentine legations in foreign countries aggregated 316,756,599 pesos, the largest gold reserve ever held by the Argentine conversion office, which was established on October 31, 1899. Against this reserve the paper, nickel, and copper money issued totaled 1,012,919,524 pesos paper.———According to the recent MESSAGE of the governor of Cordoba read before the legislature, the revenues of that Province have steadily increased since 1912, increasing from 9,698,464 pesos in 1914 to 9,988,251 pesos in 1915. The expenditures of the Province have never exceeded those prescribed by the budgets. The first 100 kilometers of the RAILWAY LINE of the Argentine Central from Peyrano to Rio Cuarto was recently opened to public service.———According to the report of the Argentine POSTAL SAVINGS BANK, which was established on April 5, 1915, during the 1 year and 25 days of its operation up to May 1, 1916, the total number of depositors aggregated 97,044, and the total deposits 4,541,463 pesos national currency. The total number of agencies in operation throughout the Republic was 884, and in 1915 there was an average of 29.39 pesos for each depositor. In 1916 the monthly averages for each depositor were: January, 54.81 pesos; February, 60.47 pesos; March, 65.02 pesos; April, 52.98 pesos.———The executive committee of the FIRST NATIONAL MEDICAL CONGRESS, to be held in Buenos Aires in September, have made some minor changes in the projected program and have added some important themes for discussion by the Congress.———Negotiations are now under way between the Argentine Government and a colonizing company for establishing on the Government lands in Argentina a large AGRICULTURAL COLONY of over 1,000 settlers from the United States. The Argentine minister of the department of agriculture desires to turn the land over direct to the settler, to avoid speculation.———The Argentine Government has appropriated 2,000,000 pesos to be distributed throughout the Republic and expended in useful works in commemoration of the centennial celebrations. Only one-half of the APPROPRIATION will be spent in 1916, the rest being reserved until the completion of works now being undertaken. ———On May 2, the new HIGHWAY from Cordoba to Las Cumbres, more than 100 kilometers in length, was opened to tourists. It is one of the best scenic routes in the Republic, crossing the mountains of Cordoba at an altitude of 2,210 meters in some places.———A NATIONAL CONGRESS OF ENGINEERING will be held in Buenos Aires in July, for which an

extensive program has been prepared, including the discussion of the construction of roads and waterways, and all subjects pertaining to hydraulic, agricultural, and electrical engineering.——A DELEGATION of business men under the chairmanship of Mr. James A. Farrell, president of the United States Steel Corporation, is at present visiting Argentina with a view to studying conditions there and promoting trade between the two countries.——In response to invitations sent out by the organizing committee of the AMERICAN BIBLIOGRAPHICAL AND HISTORICAL CONGRESS, to be held in connection with the centennial celebrations, all of the American nations and Spain have signified their intention of participating and cooperating in its work.——To commemorate the centennial celebrations, the Buenos Aires Jockey Club has presented the Association of Charities of Tucuman with the sum of 100,000 pesos for building a SCHOOL FOR WORKMEN to be called the Buenos Aires Jockey Club School, and to be located opposite San Martin Square in Tucuman.——A North American syndicate with a capital of $2,000,000 has asked for certain concessions in the Province of Buenos Aires with a view to locating a large plant there for the manufacture of Portland CEMENT on a large scale.——An important ART EXPOSITION was opened in Cordoba on May 7, 1916. The exhibits in old paintings, tapestries, and colonial carpets were especially noteworthy.——According to the recently published official CATTLE CENSUS of the Province of Buenos Aires, that Province has 11,336,513 cattle, 18,528,641 sheep, 3,371,179 horses, and 1,324,408 hogs, showing increases over the last census of 1908 of 985,278 cattle, 851,226 horses, 613,167 hogs, and a decrease of 16,076,151 sheep. The increase in value over the 1908 census is 674,212,755 pesos for cattle, 101,667,170 pesos for horses, 8,713,160 for hogs, and 45,433,595 pesos for sheep, or a total of 830,027,170 pesos increased valuation during the 8 years since the census of 1908.——The FREIGHT TRAFFIC of the port of Buenos Aires for the first 4 months of 1916 was as follows: Imports, 24,881 carloads, or 561,620 tons; exports, 7,870 carloads, or 142,391 tons.——On July 4, 1916, the Social Argentine Museum will inaugurate the new LIBRARY of 9,000 volumes, with which it was recently presented by the American Association of International Arbitration of New York. A majority of the books refer to the Argentine Republic, and were written by citizens of the United States and other countries.

BOLIVIA

INTERNATIONAL TRAIN SERVICE, including about 125 miles over which the mule coach must be used, between La Paz and Buenos Aires, has been improved and the overland journey is now

made in one week. The weekly train leaves La Paz on Fridays at 1.25 p. m.; arrives Uyuni, 7.47 a. m. Saturday; arrives Atocha, Saturday, 1.34 p. m.; stage leaves Atocha 6 a. m. Sunday; arrives La Quiaca Monday, 5 p. m.; train leaves La Quiaca 7 a. m. Tuesday; arrives Buenos Aires 7.30 a. m. Thursday. The distance between the two capitals is approximately 1,500 miles. The minister of public works of Bolivia recently made a personal inspection of the progress of work on the railway now building between Atocha and La Quiaca, and his visit served to spur the activities of contractors.———Six automobiles to be used for freight and passengers are to be placed in service between railheads on the ORURO–COCHABAMBA LINE to Cochabamba. Travel between the points of Buen Retiro and Vinto now being made by stage coach is entirely too slow to handle the constantly increasing business, and the introduction of motor cars it is thought will greatly relieve and improve the service.——— The Bolivian Government has constructed a radio tower on the Pilcomayo at a place called Patino, and WIRELESS MESSAGES have been exchanged between officials of the Governments of Bolivia and Paraguay. The Paraguayan messages were sent from the tower at Asuncion, passing through the station recently erected on the Pilcomayo, and then to La Paz, thus uniting the two capitals for the first time by wireless service.———On the 10th of November next there will be inaugurated in La Paz a NATIONAL EDUCATIONAL EXHIBITION, for the purpose of bringing the work of Bolivian students to public attention. Two previous exhibitions of the same character have demonstrated the wisdom of thus bringing together the country's talent as shown by the exhibition. The latter will remain open one month.———Newspaper reports show that the "Comunidad Petrolifera de Santa Cruz de Bolivia," the new company which took over the CONCESSIONS FOR OIL LANDS in the Department of Santa Cruz, is preparing to raise a capital of about $10,000,000 with which to enter actively into the development of the lands. The company is financed largely by Chilean capital, especially from certain nitrate companies, and the oil produced will be devoted to use in Chile and Bolivia.———As an illustration of the renewed activity in mining operations in Bolivia it is interesting to note the following facts: Two years ago there were in the whole country only two enterprises engaged in mining wolfram; today there are 200 COMPANIES, large and small, actively working wolfram mines. These enterprises would probably be still more active if ships were available at reasonable freight rates; at present about 7 per cent of the value of a given commodity is the rate charged on ships to Europe and the United States from Bolivian shipping points on the Pacific.———The members of the COMMISSION FROM THE UNITED STATES en route through South America, returning the visit of the South American delegates to the financial congress held

in Washington in 1915, were most cordially received in Bolivia by President Montes and other high officials of the Government. Public and private banquets were given in their honor and numerous addresses were made by the guests and their hosts.———The minister of agriculture, Dr. Victor E. Sanjines, has addressed communications to the Prefects of Sucre and of Santa Cruz, respectively, calling attention to the possibilities of producing sugar cane on a large scale. Certain data is called for which may serve as a basis for greatly increasing the activity in the CULTIVATION OF SUGAR CANE, an agricultural crop that now commands a very high price.——— Bolivia will be well represented in the forthcoming child's congress to convene in Buenos Aires in August next. Delegates, and also abundant exhibits of the work, will show the country's activities in teaching the child as well as caring for his welfare.

BRAZIL

In his MESSAGE to Congress of May 3 last, Dr. Wenceslao Braz, President of the Republic, refers to the revision of the customs tariff, promulgation of the Civil Code, reform in instruction, reduced expenses in all administrative departments, satisfactory international relations, and other important matters of his administration. Credit is given to the national steamship companies for partly relieving the crisis in the shipping trade, which is still acute due to lack of shipping facilities. The Executive calls attention to the cordial reception accorded Dr. Lauro Müller, minister of foreign affairs, on his visit to the Argentine Republic, Uruguay, and Chile, and to the peace and friendship treaty negotiated between Argentina, Brazil, and Chile. Marked improvement is noted in the sanitary conditions of the Republic, especially of the capital city, where the death rate for 1915 was 22.54 per 1,000 inhabitants. The total railway receipts increased from 40,867 contos paper (conto paper=$250) in 1914 to 41,809 contos in 1915, and expenses were reduced by substituting on many lines oil and wood as fuel, instead of coal. There were 26,062 kilometers of lines in operation on December 31, 1914, which increased to 26,282 kilometers in 1915, not including over 12,000 kilometers of lines under construction and of those for which plans have been approved. A statement of the finances of the Republic shows that in 1915 there was a deficit of 145,616 contos paper. The foreign commerce of Brazil in 1915 amounted to 1,605,630 contos paper, 1,022,634 contos being the value of the exports and 582,996 contos that of the imports, showing an increase in value over 1914 of 1.3 per cent gold. The exportation of frozen meat increased considerably, 8,514 tons being exported in 1915. There was an increase of 400

per cent in exports to Norway, 347 per cent to Sweden, 326 per cent to Denmark, 58 per cent to France, 22 per cent to the Argentine Republic, and 16 per cent to the United States. Imports increased 56 per cent from the United States, 53 per cent from Sweden, and 40 per cent from the Argentine Republic.———On May 13, in the presence of the President of the Republic and other high Government and State officials, the extensive BOTANIC GARDENS at Nictheroy, State of Rio, were opened to the public.———From July 1, 1915, to April 25, 1916, 10,112,141 bags of COFFEE of 60 kilos (132.28 pounds), valued at 394,373 contos, were exported from the State of Sao Paulo. On April 25, 1,250,000 bags were at the port of Santos ready for shipment, and it was estimated that 800,000 bags more of the present crop were at interior points of the State. ———The new LYCEUM OF ARTS AND CRAFTS, inaugurated in Rio de Janeiro on May 8 with impressive ceremonies, has an attendance of 2,062 students, 1,734 being males, and 328 females.———The State of Pernambuco has effected a loan of 2,000 contos from the Bank of Brazil for completing the WATER AND SEWERAGE SYSTEMS of the city of Recife.———Sergipe, the SMALLEST STATE in Brazil, with an area of 39,000 square kilometers and a population of 450,000 inhabitants, has in its 34 municipalities 67 factories turning out manufactured products and employing 3,846 workmen. The State has 200 sugar plantations and 26 refineries. Its 380 salt mines employ 1,186 workmen. The best breeds of cattle have been imported and in 1914 there were in the State 262,000 head of cattle, 82,000 horses, 49,000 mules, besides large numbers of hogs and sheep. Special attention is now being given to the cultivation of the cacao tree, which produces four years after planting, the number in bearing at present being 160,942. The great success in agriculture is due to the use of the most modern implements and scientific methods.———On December 31, 1915, the city of Rio de Janeiro had a population of 961,822 inhabitants. ———In the first quarter of 1916 the EXPORTS from Brazil amounted to 267,968 contos as compared with 260,891 contos during the same period in 1915. The imports during the first quarter of 1916 were 163,844 contos against 110,289 contos for the same period of 1915. The exports in the first quarter of 1916 exceeded the imports by 104,124 contos.

CHILE

About 10 years ago the first SACK AND BAG FACTORY was established in Chile at Llay-Llay. Recently this plant was acquired by a new company represented by Luis Fumagalli, who proposes to

go to the United States to purchase the necessary machinery with which to completely equip and modernize the factory. The company intends to supply bags and gunny sacks, for which there is a large and growing demand in Chile, at prices considerably lower than the cost of the imported articles. The Puente Alto Paper Co., of Santiago, has been conducting experiments in the manufacture of nitrate and ore sacks out of native vegetable fiber, and reports that the results obtained were highly satisfactory.———The CENTRAL RAILWAY system of Chile did a freight and passenger business in 1915 amounting to 69,154,727 pesos, as compared with 64,276,321 pesos in 1913. The expenses of operation in 1915 were 63,430,448 pesos, as compared with 80,211,299 pesos in 1913. The consumption of coal in 1915 was 420,893 tons, as compared with 587,540 tons in 1913.———The port of Natales, situated in the Territory of Magellan, southern Chile, has one of the largest and best equipped PACKING ESTABLISHMENTS in the southern part of South America. This plant, under the name of "Frigorífico Bories," began operations on February 3, and up to March 18 last had slaughtered and prepared for export 102,918 head of sheep. The port has grown to such an extent that the Anglo South American Bank has arranged to establish a branch bank there.——— The NITRATE shipped from the port of Mejillones in April of the present year consisted of 548,850 sacks, containing 52,614,715 kilos.———The society for the encouragement of the education of Chilean STUDENTS abroad has sent Leon Chamudes to the United States to complete a course in industrial chemistry.———The department of public works of the Government of Chile has investigated and reported upon the seven different routes under consideration for the construction of a NEW RAILWAY from Valparaiso to Santiago and has recommended as the most desirable the survey via Maipu, Curacavi, Zapata, and Las Piedras, connecting at Quilpue and El Salto with the line now in operation. The route selected has the lightest grades and represents the shortest distance of any practical route between the two places.———An AGRICULTURAL MAGAZINE entitled "Practical Agriculture" (La Agricultura Práctica) was founded in Santiago in April last in the interest of agriculture in general and for the purpose of encouraging the development of farming, stock raising, and related industries in the Republic.———The INDUSTRIAL SCHOOL to be established by the Government at Temuco is one of a chain of industrial and agricultural schools which are planned to be operated, upon the recommendation of the department of education, in different parts of the country. A practical school of agriculture has recently been opened at Aconcagua, and steps have been taken to found an agricultural school for women in that Province.———The Government of Chile has established an ad honorem CONSULATE at Wellesley Hills, Mass., under the direction of David Montt García.———In 1915 the

patrons of the PUBLIC LIBRARY at Santiago were furnished with 40,416 books for reading, study, and consultation. During this period 34,185 persons made use of the library during the day and 4,303 during the night, the library being open at night for eight months of the year. Of the books used 32,158 were in the Spanish language.———Reports from Combarbala, Chile, indicate that valuable deposits of high-grade MERCURIAL ORES have been discovered at a number of places in that vicinity.———Federico Santa María, a Chilean philanthropist now residing in Paris, proposes, according to press reports, to establish a UNIVERSITY in Valparaiso, his native city, modeled after and conducted along the lines of the principal universities of the United States.———Carlos Castro Ruiz, the newly appointed CONSUL GENERAL of Chile in New York, entered upon the discharge of his official duties on June 17, 1916.———The total value of the COASTWISE CARGO for the port of Punta Arenas for the year 1915 aggregated 8,677,134 pesos, as compared with 5,505,592 pesos in 1914, or an increase in 1915 of 3,171,542 pesos.

COLOMBIA

The President of the Republic by a decree of May 5, 1916, convoked the NATIONAL CONGRESS in extra session on July 20 of the present year, to consider administrative and fiscal matters requiring urgent attention.———Dr. Aurelio Rueda Acosta, ex-secretary of public works, has been appointed CONSUL GENERAL of Colombia in New York to take the place of Jorge Moya Vásquez.———According to data published by the Secretary of the Treasury, the exports of COLOMBIAN GOLD from 1905 to 1915 represent a value of $42,081,847.———The legislature of the Department of Cundinamarca has passed a law imposing a tax of 60 centavos per kilo on TOBACCO, either in the leaf or manufactured, raised in that Department or imported therein from abroad.———For the celebration of July 20, the anniversary of the national independence, the Public Improvement Society of Medellin will inaugurate a stock, agricultural, floricultural and horticultural FAIR.———Up to May 5, 1916, TREASURY NOTES have been issued to the value of $1,876,879 gold, $1,296,963 of which have been redeemed, leaving $579,916 in circulation.———Beginning with August 1, next, 25 per cent of the revenues derived from the tax on tobacco in the Department of Caldas will be used in the construction of the Manizales to Rio Magdalena RAILWAY, and 10 per cent for the municipalities.———The Government of the

Department of Caldas has commenced the construction of a departmental INSANE ASYLUM which will have men's, children's, and women's wards.———A scientific committee composed of the director of hygiene of the Department of Valle and the head physician and engineer of the sanitation committee of that port will study the hygienic condition of the coast of Malaga Bay and Palma Island, and report upon the advisability of erecting a SANITARY STATION at Buena Ventura, the latter place having an abundant supply of potable water and a desirable location at the entrance of the bay.———The legislature of the Department of Caldas has passed a law requiring the immediate construction of the works for the improvement of PORT DORADA on the Magdalena River, paying particular attention to the sanitation of the same.———According to newspaper reports concerning the NORTHEAST RAILWAY, the new line, starting from the extreme northern part of the city of Bogota, will run through the towns of Guasca, Sesquile, Gachancipa, Tocancipa, Suesca, Villapinzon, and Choconta, in the Department of Cundinamarca, passing thence into the Department of Boyaca in the direction of Tunja, Paipa, Duitama, Santa Rosa, Belen, and Soata. From the main line one of the branches will be built to Guavio, another to Guateque, another to Sogamoso, and still another, the most important of all, from Tunja in the direction of Carare, via Chiquinquira.———From January 1, 1914, to April 1, 1916, there were established in Colombia 53 new TELEPHONE offices in different parts of the Republic.———Early in May last, the Government incinerated at the mint in Bogota 15,000,000 pesos of old PAPER CURRENCY.——— On May 21, last, a bust in honor of Miguel de CERVANTES y Saavedra, author of Don Quixote, was unveiled in the Plaza de Espana (Spanish Park) in Bogota, in the presence of more than 3,000 persons, among whom were high officials of the Government and members of the diplomatic and consular corps residing in Bogota. The bust is the work of the Colombian artists Ricardo Acevedo Bernal and Polidoro Cuéllar.

COSTA RICA

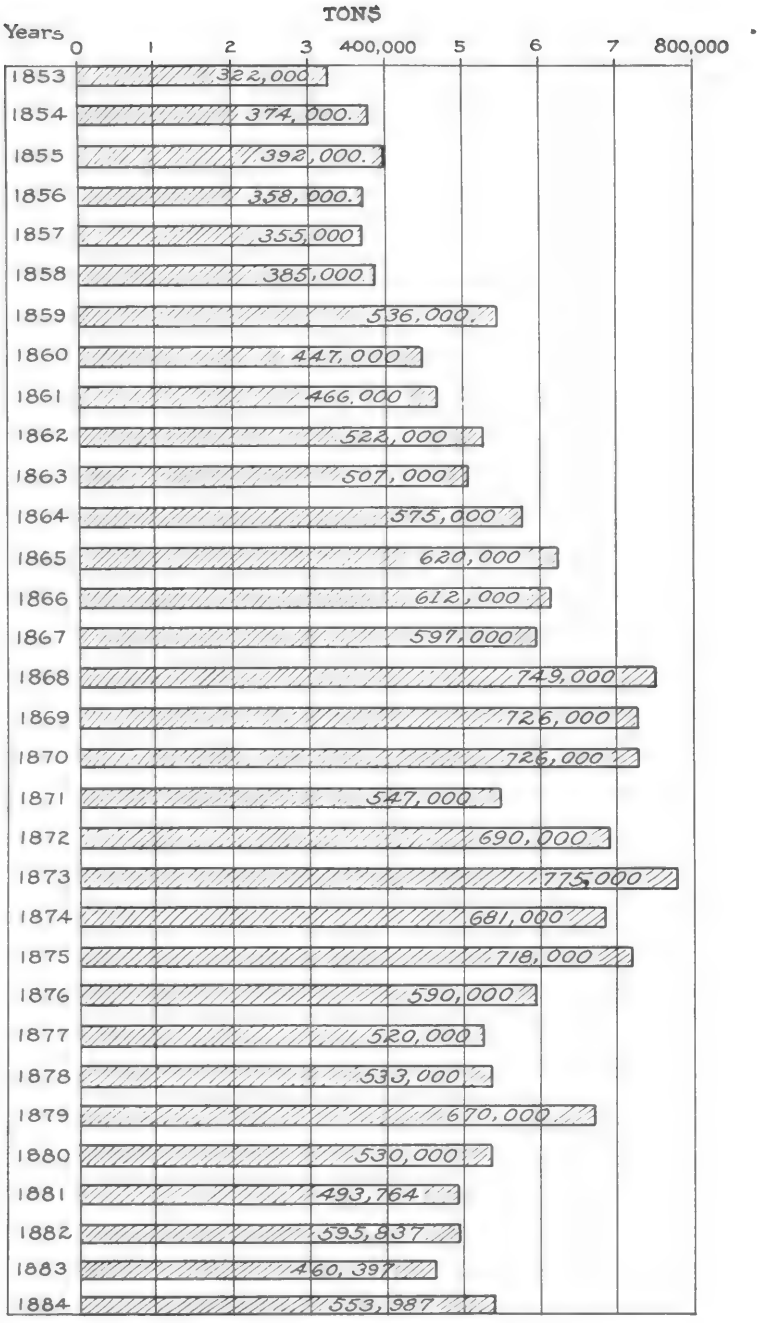
At its session of May 24, the eighth anniversary of its founding, the CENTRAL AMERICAN COURT OF JUSTICE elected Dr. Bocanegra of Guatemala, President, and Dr. Gutierrez Navas of Nicaragua, Vice President, for the year beginning May 25, 1916.——— La Informacion, a daily newspaper of San Jose, states that COMMERCIAL CONDITIONS in Costa Rica are steadily improving. Limon and Cartago have developed an important industry in supply-

ing the Canal Zone with fresh fruits and vegetables, and as Costa Rica produces all the fruits and vegetables of both the Temperate and Torrid Zones, with means of transportation always at hand, she is likely to become the principal source of supply for the canal and the ships using the canal. While exports exceeded imports in value by several million dollars in 1915, both are showing favorable increases in 1916. Imports from the United States increased 3 per cent in 1915 with promise of a larger increase for 1916. Interest on the foreign debt has been promptly paid. About 10,000,000 bunches of bananas were exported in 1915 and the planting of cacao has increased considerably. New mining companies with extensive capital are making investigations that promise a great development in the mining industry. Though the revenues have been reduced owing to the war, the country is now on a much firmer footing financially than it has been for many years.———Students in the SCHOOL OF AGRICULTURE are now required to do practical field work in connection with their class-room studies, frequent excursions being made to important farms where instructors make practical demonstrations and assist students in carrying out experiments.———According to press reports, a Pittsburgh syndicate has recently sent representatives and expert engineers to Costa Rica to report on OIL AND MINING conditions, with a view to exploiting the recently discovered petroleum deposits and promoting important mining activities. Representatives of the syndicate have located permanent offices at San Jose.———On June 1, a PROFESSIONAL SCHOOL FOR GIRLS was inaugurated in San Jose, thoroughly equipped for giving practical instruction in domestic arts and sciences, together with music and such other subjects as may be deemed desirable.———Foreign capitalists have asked the Government for certain concessions with a view to locating a plant in Costa Rica for the manufacture of Portland CEMENT. During the past 10 years an average of 30,000 barrels per year have been imported and it is the object of the proposed plant to supply all the needs of the country.———Congress has passed a law accepting the plan outlined in the President's message for establishing a department in the International Bank, with a capital of 500,000 colones, for MORTGAGE LOANS on long terms and at low rates of interest to small landowners. No loan is to exceed the sum of 2,500 colones, and the value of the property mortgaged must be at least double the amount of the loan.———Preparations have already begun for celebrating in December, 1916, the centenary of the founding of the FIRST OFFICIAL SCHOOL BUILDING in Costa Rica, which was completed at Santo Tomas in December, 1816.———Congress has recently approved concessions granted to Mr. Leo J. Greulich for exploiting certain petroleum deposits, and to Mr. Herbert Houston for the cultivation of 20,000

hectares in bananas in the reserved zone called Astua–Pirie.———The secretary of finance has announced that he will shortly arrange for renewing the LOAN CREDIT of $500,000 with New York bankers for normalizing the exchange.

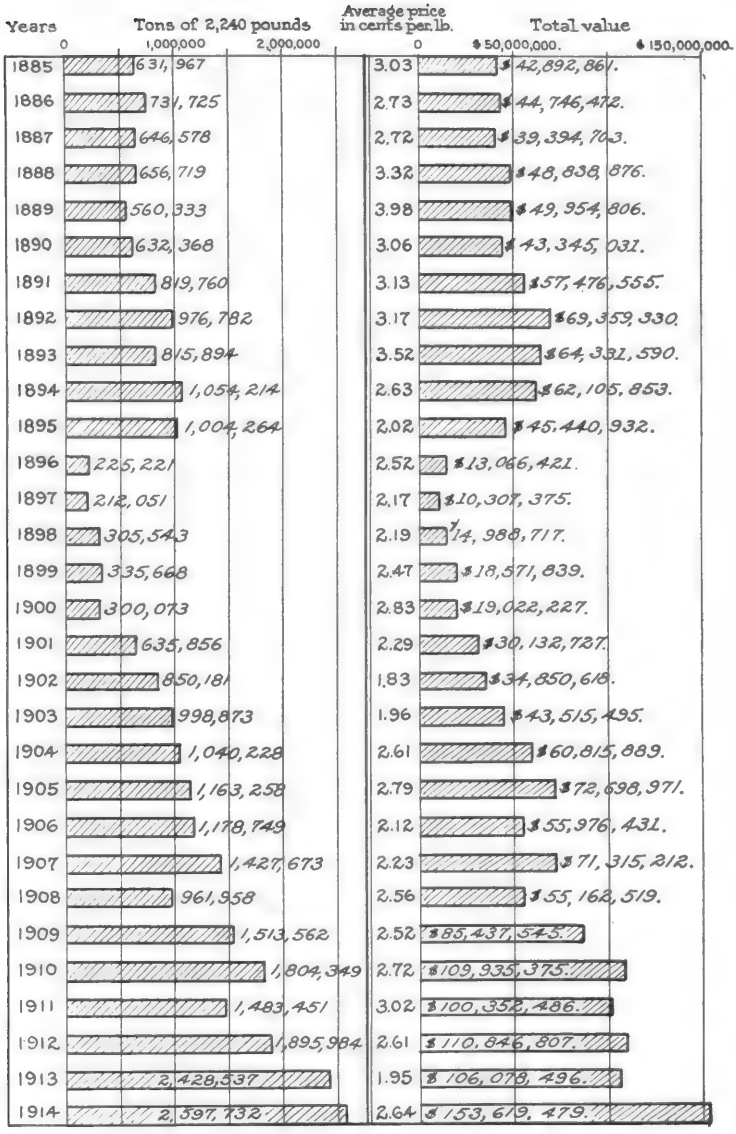
CUBA

A recent executive order cancels all permits for WIRELESS INSTALLATIONS in the Republic except those operating in accordance with the Cuban neutrality proclamation of August, 1914. The decree affects wireless stations maintained by universities, observatories, corporations and private parties for educational or other purposes. This action was taken by the Government so as to enable it to observe strict neutrality in the European conflict.———Luis Carmona and Braulio Martinez have petitioned the department of public works for permission to establish a new line of passenger and freight FERRYBOATS between Regla and Habana, and request authority to construct docks at such places as may be approved by the department of public works.———General Freyre de Andrade, mayor of the city of Habana, has donated $5,000 to the new TUBERCULOSIS SANITARIUM for children at Cojimar. The hospital is owned by the Cuban Government and was opened for use on June 30 last. The grounds overlook the sea and the surroundings are ideal. ———The NATIONAL BANK of Cuba has ordered the payment on and after July 1, 1916, of the regular semiannual dividend of 4 per cent, plus an extra dividend of 1 per cent.———The secretary of public works has approved the plans of the new administration building of the HABANA UNIVERSITY. According to reports, the edifice, when completed, will be both unique and beautiful. There will be a large loggia in the center of the two laboratory buildings, with 16 Corinthian columns 30 feet high forming a court of honor. In the center will be a statue of Luz Caballero, the founder of the Cuban educational system.———The Habana Central RAILWAYS have petitioned the department of public works for permission to construct electric lines from Habana to Melena del Sur, San Nicolas, Batabano and other towns.———The department of sanitation has recommended to the Cuban Government the immediate repair of the STATE WHARVES in the city of Habana in such a manner as to make them as nearly rat proof as possible.———The Cuban Senate has approved a law providing for the establishment of LEGATIONS in China, Panama, Santo Domingo, and Haiti, and consulates at Charleston, Honolulu, Canton, and Yokohama. The jurisdiction of the Cuban Minister to Germany is extended to Switzer-



SUGAR PRODUCTION OF CUBA FOR 32 YEARS, 1853-1884.

(From statistics by Gabriel Carol, special inspector of the Department of Agriculture, Commerce, and Labor.)



SUGAR PRODUCTION OF CUBA FOR 30 YEARS, 1885–1914, AND VALUES.

(From statistics by Gabriel Carol, special inspector of the Department of Agriculture, Commerce, and Labor.)

land, and the consulate at Lyons, France, is changed from an honorary to a second-class consulate.———President Menocal has promulgated the EMPLOYER'S LIABILITY LAW. Under this law indemnities varying with the seriousness of the accident are payable to the employee or to his family should death result from the injury. The law requires employers to insure their employees in some company acceptable to the latter.———In May, 1916, the Cuban Telephone Co. of Habana had 21,582 TELEPHONES in use, as compared with 18,941 during the same month of the previous year. The receipts of the telephone company in May, 1916, were $133,283, or $23,384 more than during the same month of 1915.———The city of Sagua la Grande, Province of Santa Clara, is to have a new SCHOOL BUILDING. The plans have been approved by the Government and $30,000 pledged for the construction of the edifice.———The Isle of Pines Appeal reports that a HYDROGRAPHIC SURVEY is being made by the United States Government of the south coast of Cuba and the waters around the Isle of Pines, and that work has been mapped out which will require a term of about six years to complete.——— The President of the Republic recently signed bills calling for the following APPROPRIATIONS: $6,000 to the college of attorneys in Habana for a national congress, $50,000 for a road from Santo Domingo to Sietecito, $200,000 for a road from Santa Clara to Manicaragua, $171,000 for the paving of Matanzas, and $7,000 for a bridge over the Jiguani River.———The Postmaster General of Cuba has notified Cuban postmasters that on and after July 1, 1916, PARCEL-POST PACKAGES from the United States weighing more than 4 pounds will be returned to sender. Heretofore overweight packages have been delivered to addresses as a matter of courtesy, but the practice is now to be stopped and strict adherence to treaty provisions maintained.———A bill has been introduced into Congress providing for the taxing of SIGNS and advertisements not written in the Spanish language.

DOMINICAN REPUBLIC

An executive decree of April 10, 1916, approves the contract signed on April 7 of the present year between Jacinto B. Peynado, secretary of justice and public instruction, and Jaime Sanchez, to continue the compilation, printing, and distribution for account of the Government of all the LAWS, ORDERS, AND DECREES issued by the legislative and Executive powers from December 17, 1889, to the year 1915. In December, 1899, the official publication of laws, orders, and decrees was interrupted, and the continuance and

completion of this work in an orderly and systematic manner will be a great benefit to persons interested in the laws and progress of the country. Under this contract Jaime Sanchez is authorized to print at his own expense a volume containing the principal laws which he deems of interest and to place same on sale.———L. Pardo, a Danish subject, reports the discovery of DEPOSITS OF ORES containing copper, iron, and silver in the commune of San Cristobal, Province of Santo Domingo. The boundaries of these deposits are specified in detail in the Official Gazette of Santo Domingo of April 26, 1916. The same publication contains a denouncement of mining claims by Manuel Del Monte, reputed to contain silver, iron manganese, and gold ores, as well as coal, situated at different places in the Department of Santo Domingo.———A MUNICIPAL VACCINATION OFFICE has been established in the city of Santo Domingo on the lower floor of the municipal palace, now in course of construction. The office is in charge of Drs. Pedro A. de Marchena, Rodolfo y Baron Coiscou, and Mario E. Mazara.———The Royal Bank of Canada, which has assets according to a late statement of $214,000,000 and a paid-up capital and reserve fund of $24,992,000, has established a BRANCH BANK at Santiago de los Caballeros. In addition to the general banking business of this institution, a savings department is added which accepts deposits of a value of not less than $1.———El Diario, a daily newspaper of Santiago de los Caballeros, states that Engineer J. T. Collins, who is at present temporarily in charge of the DOMINICAN CENTRAL RAILWAY, has returned to the Dominican Government $9,000 loaned the railway to meet the expenses of operation, the receipts now being sufficient to pay running expenses and employ about 180 men in repair work. In addition to this return payment, it is reported that another debt of the railway company of about $7,000 has been liquidated to a banking company. These transactions show that the railway in question is well managed and is being operated on a paying basis.———The WATER company at Santiago de los Caballeros makes a charge of $2.50 per month for the use of a hose for sprinkling and other purposes, but does not install same except where the customers have at least two water faucets in use.———On May 12, 1916, the Central Dominican Railway put into operation a new tariff for the transportation of CAMPECHEWOOD from points on its line to Puerto Plata. The rates vary from $8.50 per thousand kilos from Moca (the most distant station) to Puerto Plata, to $6 per thousand kilos from Bajabonico (the nearest station) to Puerto Plata.———The Government of Santo Domingo has authorized an issue of POSTAGE STAMPS consisting of 50,000,000 of the denomination of one-fourth of a centavo, and 50,000 of the denomination of one centavo.

ECUADOR

An association was recently organized in the flourishing city of Azogues under the name of the MUTUAL AID SOCIETY of Azogues, the principal objects of which are moral advancement and the mutual aid of its members. Sr. Augustin Garzon of that city was elected president of the society. ———On May 24, 1916, the National Telephone Co. of Guayaquil opened to public service its new TELEPHONE office and suspended indefinitely the use of the old instruments which are to be replaced with others of the most modern type.———Press reports state that the work of installing the new WIRELESS telegraph station on the Island of Puna in the Province of Guayas has been commenced and will be completed in the shortest time possible.———According to data published in the Grito del Pueblo, a daily newspaper of Guayaquil, there are at the present time under construction in that country the following PUBLIC WORKS: Sanitary waterworks of the city of Guayaquil, contracted for by the J. G. White Co., London; the Curaray Railway; the Sibambe Cuenca Railway; the Guayaquil Coast Railway; the railway from Babahoyo to Balzapampa; the railway from Manta to Santa Ana, contracted by a French-Belgium company; the railway from Puerto Bolivar to Zamora; and the railway from Quito to Esmeraldas, all of which are of the greatest importance in the development and progress of the country. The Society of the SCHOOL OF MEDICINE of Guayaquil, the president of which is Dr. Jose M. Extrada Coello, celebrated the twentieth anniversary of its foundation on May 5, last. Addresses were made by a number of members, setting forth the important work which the organization has accomplished from its inception up to the present time.———The bureau of SANITATION has appointed a commission consisting of Sófocles Dávila and Evaristo Polo, health inspectors, to organize the sanitation works of Rocafuerte Canton, Province of Manabi. The National Government has appropriated 2,000 sucres to defray the expenses of its preliminary work.———On May 1, 1916, LABOR DAY was celebrated with appropriate ceremonies throughout Ecuador. In the federal capital there was an imposing parade led by the organizations of Knights of Labor, barbers, carpenters, and blacksmiths, followed by other workmen's societies and the schools of the city, who marched through the principal streets of the national capital to Rocafuerte Plaza, where, after music by the band and the singing of the national anthem, the parade disbanded. In the evening of the day referred to, a meeting was held at the headquarters of the Knights of Labor in Quito, in which all of the labor organizations of the city partici-

pated.——According to the report submitted to the shareholders by the board of directors of the Association of Agriculturists, whose organization is composed of 20 members, the CACAO plantations of the association produce one-fourth of the annual cacao crop of the country, or, in round numbers, 2,080,000 pounds. The report recommends a search for new markets and that special efforts be made to export cacao in large quantities to Spain, which country, prior to 1866 was the principal consumer of Ecuadorean cacao, but which now receives most of its supply of cacao from its colonies and from Venezuela and Cuba.

GUATEMALA

The National Legislative Assembly has conferred upon the President of the Republic power to CONTRACT LOANS, pay public indebtedness, levy duties, amend the tariff, modify the budget, and do such other things as he may deem advisable for the betterment of the economic condition of the country. The Executive is required, however, to give an account to Congress at its next regular session of any action taken by the President under this authorization.———President Manuel Estrada Cabrera has promulgated a law authorizing the mintage of 2,000,000 pesos in COPPER COINS in denominations of 12½ and 25 centavos.———The most important WHEAT belts of Guatemala are at Tecpam, Patzum, Comalapa, Patzcicia, and Santa Cruz Balauya, where the average yield per hectare is reported to be nearly one and one-half times greater than the average yield of the United States, and over twice as great as the average yield of Russia. With the object of improving the grade and increasing the yield of wheat in Guatemala, seed has been imported from the United States, Argentina, Germany, Canada, and France, but up to the present time no foreign seed has equaled in quality and productiveness the native wheat now grown in the country under the names of "Sipac," "Cruceño" and "Blanco."———The railways of Guatemala have put into effect the following rates on imports and exports of LUMBER, the quotations being given in American gold per metric ton per mile: Atlantic district, sawn lumber, in slabs, less than car load lots, 5 cents; carload lots, 3 cents. Pacific district, lumber, sawn or in slabs, 5 cents. A special price is given for exports of lumber via Puerto Barrios from points to the west of Santa Maria, in carload lots, of 2 cents American gold per metric ton.———A report of the ELECTRIC LIGHT CO. of Guatemala for 1915 shows that on December 31 last the company had in operation 29,864 16-candlepower lamps and 501 motors, representing

1,496 horsepower. Plans have been made for the erection of an electric light plant at San Luis Buenavista.———A report of the Treasury Department of the Government of Guatemala, covering the past year, states that the FOREIGN COMMERCE of the Republic in 1915 aggregated 16,639,062 gold pesos, made up of exports, 11,566,586, and imports, 5,072,476 pesos. In 1915 the collection of public revenues amounted to 85,007,704 pesos, consisting of customs revenues, 63,815,126 pesos; receipts from liquors, tobacco, etc., 10,479,796; other taxes, including tax on real and personal property, 6,224,629; telegraph and telephones, 3,098,169; and postal receipts, 1,389,984.———With the object of relieving, in so far as possible, the shortage of jute sacks in the Republic, and at the same time encourage the importation of COTTON BAGS strong enough to hold from 100 to 150 pounds of coffee or sugar, the Government has reduced the import duty on cotton bagging to 2 centavos per kilo.———According to a report of the Secretary of the Department of Interior and Justice of the Government of Guatemala, the following corporations and companies were authorized to do business in the Republic in 1915, subject to an annual license tax of 1,000 pesos: W. R. Grace & Co., South Norwalk, Conn.; Tropical Trading Co., Portland, Me.; National Prussian Insurance Co., Stettin, Germany; Frankfort Insurance Co., Frankfort, Germany; and the Novella Cement Co., New York.———There were 78,000 births and 54,600 deaths in the Republic in 1915, or an excess of BIRTHS over deaths of 23,400. During the same period the marriages numbered 3,978.———The new POSTAL TARIFF of Guatemala prescribes the following charges: For local letters, 12½ centavos for each 15 grams or fraction thereof; for domestic letters and those sent to the other Republics of Central America, 25 centavos for each 15 grams or fraction thereof; and for foreign letters, 1.50 pesos for each 20 grams or fraction thereof.

HAITI

The President of the Republic has reorganized his CABINET as follows: Secretary of interior and public works, Mr. Constant Vieux; secretary of the treasury and commerce, Dr. Edmond Heraux; secretary of foreign relations, Mr. Louis Borno; secretary of justice and agriculture, Mr. Etienn Dorneval; and secretary of public instruction, Mr. Arthur Francois.———A North American company has bought the ships of the Haitian fleet which were sold by the National Government at public auction in May last. The purchasing company proposes to use these vessels in the COASTWISE SERVICE of the Republic, as soon as the repairs which are being made on them in a shipyard of the United States are completed.———

Under an executive decree of May 17, 1916, a board of STATE COUNSELORS was appointed. This board met immediately in the senate building in Port au Prince, and elected Mr. Estephen Archer chairman and Messrs. Leo Alexis and Arthur Brameau secretaries. The President has intrusted the board with the general revision of the constitution of the Republic and the formulation of appropriate laws, in accordance with the proposed amendments to the constitution, to be submitted to the consideration of a national constitutional assembly convoked by the executive power.———According to data published by Le Nouvelliste, of Port au Prince, there are now in circulation in the country 4,381,293 gourdes, PAPER CURRENCY of the old issue, which, added to the 3,000,000 gourdes of the last issue, makes a total circulation of 7,381,293 gourdes. Of the issue of paper currency called "Nord Alexis" amounting to 10,000,000 gourdes in notes of denominations of 1 and 2 gourdes, there were incinerated in Port au Prince on May 22, last, 5,441,513 gourdes.——— The municipal council of Port au Prince, believing in the liberty and justice advocated and practiced by Abraham Lincoln, has changed the name of the street called Magasin de L'Etat to ABRAHAM LINCOLN. The streets of the capital of Haiti bearing colonial names have been renamed in honor of distinguished Haitians, among which the following may be mentioned: The street formerly called Fronts-Forts will now be called Thomas Madiou Street; Casernes Street, Enelus Robin Street; Bretagne Street, Oswald Durand; Tiremasse Street, Justin Lherisson; Reservoir Street, Dr. Aubry Street; Pavee Street, Dantes Destouches Street; Penthievre Street, Dr. Janvier Street. The city park near the cemetery will be called Leconte Park; the road to the south of the city will be called Dr. Dehous Avenue, and the road to the west of the cemetery will be called Fleury Bathier Avenue.———Le Moniteur, of Port au Prince, of May 27, 1916, publishes the complete text of the report submitted to the Secretary of the Treasury and Commerce by the Commission charged with the study of the plan to consolidate the POSTAL AND TELEGRAPH services of the Republic.———An executive decree of May 17, last, provides that CLASSICAL AND PROFESSIONAL instruction shall in future be given in the Alie Duboise School, in accordance with a ruling of the Department of Public Instruction which was published in Le Moniteur, of Port au Prince, of May 24, 1916.———Le Matin, a newspaper of Port au Prince, announces the arrival in the national capital of G. Harris, who proposes to make a detailed study of the COMMERCIAL SITUATION in Haiti for the Department of Commerce of the United States. This report is to be published as an official document for free distribution to persons interested in the commerce of the two countries.——— Emile Marcelin has been appointed CONSUL of Haiti in Mobile, Ala.

HONDURAS

La Semana Ilustrada (The Illustrated Weekly) of Tegucigalpa, commenting upon the plan of the Government of Honduras to establish an AGRICULTURAL SCHOOL at El Toncontin, expresses the opinion that if a strictly modern and well-equipped school is founded and conducted in a practical manner, that it will be of more importance and real worth to the nation than all the professional schools at present in operation in the country. The development of agriculture in the Republic, together with the building of railways and public highways leading into all of the departments, will be of incalculable service in the development of the agricultural resources of the nation, for in this way products intended for other than the local markets can be easily and quickly shipped out and disposed of where they are most needed without running the risk of having all of the profits eaten up by transportation charges.——The Republic of Honduras has over 3,658 PLANTATIONS and farms under cultivation, representing an area of 167,552 manzanas (117,286 hectares), 22,000 manzanas (15,400 hectares) of which are under irrigation. The principal products under cultivation are fiber-producing plants, bananas, coffee, sugar cane, rubber, coconuts, and cacao.——The approximate production of the Republic of Honduras in 1915 of the STAPLE ARTICLES of the country was as follows: Corn, 222,844,500 pounds; maicillo (a kind of millet), 24,655,100 pounds; beans, 14,031,200 pounds; rice, 3,252,600 pounds; coffee, 3,860,100 pounds; bananas, 6,069,379 bunches; yucca, 81,000,000 pounds; and wheat, 860,600 pounds. The bananas of Honduras come principally from the Department of Atlantida, with small quantities from the Department of Cortez and the Islands of Bahia. The coffee country is chiefly in the Department of Santa Barbara, while about one-half of the maize grown in the Republic comes from the Department of Copan. Nearly all of the wheat lands at present utilized in the country are in the Department of Ocotepeque, while the maicillo, or grass resembling millet, is cultivated in the Department of Itibuca.——The Government of Honduras has granted a SCHOLARSHIP to Conrado Bonilla, who has sailed for the United States to take up his studies in one of the colleges of that country.——The department of fomento (promotion) has leased the COCONUT PLANTATIONS of the National Government in the Department of Tela to Trinidad Raudales for an annual rental of 4,325 pesos (peso = $0.3537).——Through its consul in New York the Government of Honduras recently paid 2,625 pesos for 100 TELEPHONES and their accessories, shipped from the port of New York to Honduras.——Enrique

Toledo Lopez has been authorized by a law of Congress, duly promulgated by the President of the Republic, to establish a GASEOUS WATER FACTORY at La Ceiba and to operate same for a period of five years. The concessionaire has the privilege of importing in one shipment all the machinery needed for the installation of the factory.———The Government has leased to Ricardo Sussman, for a term of five years, the national COCONUT LANDS, situated at Port Sal, between Barra de Cuero to the east and the mouth of the Ulua River, at an annual rental of 4,100 pesos.——— The Honduran Government has SUBVENTIONED the hotel in the city of Santa Rosa, Department of Copan, conducted by Emilio Villeda R. especially for the benefit of travelers, in the sum of 100 pesos per month. ———H. O. Jeffries has petitioned the Government of Honduras for permission to establish a WHARF, customhouse, and town at Zacate Grande, or at some suitable point designated by the Government. The wharf is to be located where steamers of deep draft can anchor. If the concession is granted the petitioner proposes to build a causeway 12 meters wide between the island and the mainland, to be used as a road and tramway. The petition has the approval of the President of the Republic and only requires the sanction of Congress to make it effective.———Willing Spencer, chargé d'affaires of the Government of the United States, near the Government of Honduras, gave, at the American Legation at Tegucigalpa on May 26, 1916, an artistic and highly entertaining MUSICAL CONCERT, assisted by Mrs. Philips Davis and Mr. Harry Brown. Nearly 100 guests were in attendance.

MEXICO

According to El Democrata, a daily newspaper of the city of Mexico, the Mexican Government has at present in operation 14 WIRELESS telegraph stations. The systems in use are the Telefunken and Clapp-Eastham. The following stations are now in course of construction: Four De Forest installations located, respectively, at Alamos, Acapulco, Veracruz, and Merida, one modern Telefunken at Tuxpam, and a "Wireless Specialty" at Bacochibampo, State of Sonora. Eleven stations are planned to be erected at important points in the Republic. Large stations will be operated from Mazatlan and Guaymas, and smaller ones from Guadalajara, Manzanillo, San Blas, and a number of other places. Five large installations and several portable ones were recently ordered by the Constitutional Government in the United States.———The Mexican

Government proposes to open and operate PETROLEUM deposits on national property in the Tampico, Topila, and Panuco oil zones with the object of supplying the Government railways with fuel. It is estimated that the Constitutional railways consume about 6,000 barrels of oil per day.———According to press reports the bull ring in the city of Chihuahua has been offered to the American board of FOREIGN MISSIONS as a site for the international college which is to be transferred from Guadalajara. The various Protestant denominations doing mission work in Mexico have assigned as working territory to the American Board of Foreign Missions the States of Chihuahua, Sonora, Lower California, and northern Sinaloa, the population of which aggregates, approximately, 800,000 souls.———A recent executive decree provides for the establishment in the city of Mexico of a SCHOOL OF LIBRARIANS and archivists under the direction of Prof. Agustin Loera Chavez.———The Constitutional Government has promulgated a decree making persons who obtained divorces before the DIVORCE LAW of December 29, 1914, went into effect, legally entitled to contract new matrimonial alliances.———An executive decree has been issued by the First Chief and Provisional President prohibiting on and after June 1, 1916, and until further ordered, SPECULATION IN COIN and bank notes in the Republic.———The CUSTOMS administration at Mazatlan has been raised to an office of the second class and the personnel of customs officials increased to 90.———In April last the municipality of Torreon established nine primary SCHOOLS FOR WORKMEN, two of which have night sessions. An effort is being made to enroll as large a number of illiterates in these schools as possible. One of the features of the work which has proved quite popular is a course in the study of English.———The Mexican Government has taken steps to encourage the cultivation of COTTON and maize in northern Mexico, especially in the Laguna region of Coahuila.——An executive decree has been issued requiring the values shown in CONSULAR INVOICES to be in the money of the country of origin. Consuls are authorized to charge 3 per cent of the value of same, but in no case shall the charges be less than the equivalent of 1 peso Mexican gold.———The governor of the State of Coahuila has ordered SCHOOLS established in that Commonwealth in mining, agricultural, and industrial settlements where there are more than 30 pupils of school age without educational instruction.——An executive decree provides that after July 1 of the present year MINING TAXES shall be payable in Mexican gold coin.———For the purpose of distributing in an equitable manner the RAW COTTON produced in the Republic, of which there has been an abnormally heavy yield in the Laguna region, the Government has undertaken to provide the factories of the country with a sufficient supply of this

fiber to enable them to remain in operation.———The Provisional Government has extended the time for the REVALIDATION OF PATENTS issued under the Huerta régime until September 30, 1916.

NICARAGUA

The CUSTOMS RECEIPTS of the Republic of Nicaragua for the first quarter of 1916 amounted to $220,868, as compared with $172,133 during the same period of 1915, or an increase in 1916 of $48,735. The receipts in 1916 by months for the quarter referred to were as follows: January, $72,516; February, $60,248; and March, $88,104; while those covering the same term of 1915 amounted to $45,065 in January, $59,460 in February, and $67,608 in March.———According to the Bluefields American the Eden Mining Co. is receiving a large quantity of machinery ordered from the United States, and expects all of it to be installed and the REDUCTION WORKS in operation within a few months. Mr. J. L. Phillips, the general superintendent of this company, recently made a business trip to Philadelphia and reports that active work is in progress in every department of the company's activities in Nicaragua, and that the transportation question along the coast and upper rivers, which has been inadequate heretofore, is being solved by the increased facilities made possible at this season of the year due to the greater depth of water in the rivers.———The following are among the principal SAWMILLS of the Atlantic coast of the Republic: the mill of the Cukra Co., the Port Perlas Co.'s sawmill, and the large mill at Schooner Cay belonging to the Belanguer Co., incorporated.———The Government of Nicaragua has appointed Senator J. Leopoldo Salazar to visit the Atlantic coast of the Republic, to investigate, hear complaints, and report upon the BANANA INDUSTRY of that region, with the object of bringing about a state of affairs that will be equitable and mutually satisfactory to both the growers and buyers.———A MUNICIPAL NIGHT SCHOOL at Bluefields was opened to the public in Municipal Hall in June last. The school is under the direction of Prof. John Bravo of the Cristobal Colon College, and commenced its sessions with an enrollment of about 50 students of both sexes.———According to press reports from Managua the Nicaraguan Congress has ratified the entire Atlantic Coast RAILROAD CONTRACT with the New York bankers.———A United States COLONIZATION company, represented by S. S. Wright of Cedar Rapids, Iowa, has purchased a large tract of land in the Pearl Lagoon District of the Atlantic coast, which it proposes to

sell on easy terms, in small lots, to actual settlers. This company investigated a number of properties in different parts of Central America and finally selected lands on the East Coast of Nicaragua.———According to La Voz del Atlantico (The Voice of the Atlantic), a weekly newspaper of Bluefields, the PEARL LAGOON RAILWAY on the Atlantic coast is being rapidly constructed. Fifteen miles of the line are at present in operation, and about 40 miles of roadbed have been completed and are ready for the laying of the ties and rails.———A Chicago firm recently inspected the SPONGE FISHERIES at Mosquito Cays about 30 miles southeast of Cape Gracias a Dios. The expert was of the opinion that the sponges were not obtainable in sufficient size and quantity to warrant their shipment, in the present state of the market, to New York.———The Concordia mine on the Atlantic coast of Nicaragua has placed an order in the United States for the machinery necessary to install a CYANIDE PLANT. Until this plant is in operation the mine proposes to continue treating its free milling ores obtained from the surface veins of the property.

PANAMA

An AGRICULTURAL SETTLEMENT of experienced American farmers, 42 in number, has been established and is operating as a stock company in Trinidad Valley on the shores of Gatun Lake, to develop a 100,000-acre tract of upland. L. S. Meyer, the business manager of the colony, reports that the colonists will till the soil with their own hands and that it is their intention to become citizens of Panama. A sawmill has been erected in a timbered section of the tract referred to and is now in operation. While the colonists at present are living in temporary houses with thatched roofs, they intend in the near future to erect more permanent dwellings and to increase the number of the colony to 100. Tentative plans have been made with the Government of Panama to occupy some of the region between Gatun Lake and Indios and Cocle rivers on the Atlantic side of the Isthmus. A gasoline launch is in use by the settlers for transportation purposes and the development of their plans.———Statistics furnished by the United Fruit Co. show that that corporation has planted in its Bocas Division of Panama 114,921 cacao trees, which produced during the past season 1,841,000 pods. Part of the Changuinola plantation, which some years ago was planted to CACAO, is just beginning to bear, and at the present time 500 acres near Chiriqui Grande are being set out in cacao plants. It is reported that a complete cacao handling installation, equipped

with a vacuum-drying process and other modern improvements, has been ordered and will soon be erected and placed in operation in the Bocas division.———The HOT SPRINGS near Calobe in the Veraguas mountains, while somewhat inaccessible and lacking at the present time in modern hotel conveniences, are very popular on account of the therapeutic value of their waters. The hot springs at Chame, province of Panama, and at Chiriqui are also famous, but are not patronized to the extent the Calobe Springs are.——— Luis Martinelli, an Italian subject, who owns timber lands and operates a sawmill at San Lorenzo, province of Veraguas, recently marketed 12,000 feet of sawed MAHOGANY logs for domestic consumption. Orders for Panama mahogany logs have been received from the United States and Europe in such quantities that the sawmills of the country have been unable to fill them with the promptness desired. In addition to mahogany, the San Lorenzo district contains oak, guayacan, nispero, and cedar.———The Panama Association of Commerce has requested the Panaman Government to cancel outstanding permits to purchase in the COMMISSARIES of the Canal Zone, and to refuse in future all applications for this privilege on the ground that the present system causes unfair discrimination.———The Panama press has recently been agitating the question of the advisability, for sanitary reasons, of establishing a GARBAGE DISPOSAL plant in the national capital. The decision of the matter lies within the jurisdiction of Congress.———The SALVATION ARMY has acquired a new hall at Bocas del Toro, the funds having been raised by private subscriptions and contributions.———The imports of LIQUOR of all kinds into the Republic of Panama in 1914, according to a report of Consul General Snyder, amounted to $73,232, of which $40,550 represented the value of red wine, and $28,370 the value of whisky.

PARAGUAY

Practically all the ORANGES imported into the Argentine Republic come from Paraguay. In 1913 the exports of this fruit from Paraguay to Argentina numbered 145,043,000, valued at 213,437 Argentine gold pesos (gold peso = $0.9648). In 1914 and 1915 Argentina imported oranges, most of which came from Paraguay, to the value of 244,601 and 345,640 gold pesos, respectively. In 1915, in addition to the large fluvial transportation of Paraguay oranges to Buenos Aires and intermediate ports, about 1,000 cars were employed by the railways in transporting this fruit to Argentina. Paraguay oranges are of a quality and size which exactly meet the requirements of

the Argentine markets, and the orange lands of the Republic can be made to produce this fruit in sufficient quantity to meet the ever-growing demands of the export trade and have an ample supply for the consumption of the home market.———The department of foreign relations of Paraguay has received a laudatory report from the capital of Uruguay concerning Paraguayan STUDENTS who are studying in Montevideo, and certifying to the industry, good conduct, and progress of the same. These students were sent to the Uruguayan metropolis to study in the normal, agricultural, and other schools of the Republic.— — —El Diario, a daily newspaper of Asuncion, recently published an extensive report of the director of the BOTANICAL AND ZOOLOGICAL GARDEN of the Government of Paraguay, situated at Trinidad on the Paraguay River in the immediate vicinity of Asuncion. The report covers the year 1915, during which period a number of improvements were made in the buildings, grounds, and equipment of the garden. An agricultural school is maintained at this place, and students are fitted for theoretical and practical work on the farms and plantations of the Republic. The entire work is under the direction of Dr. Fiebrig. Plans for providing the garden with a port on the Paraguay River sufficient to accommodate the business of the institution have been drawn up and the advisability of putting them in effect is being considered.——— The TYPOGRAPHICAL SOCIETY of Paraguay is preparing a pamphlet giving a history of printing in the country from the date of the installation of the first printing press, enumerating as far as possible the books and pamphlets published in Paraguay up to the present time, and giving a list of the establishments which have been engaged in the printing industry of the nation up to 1916.———Press reports from Asuncion indicate a strengthening of confidence in the commercial transactions of the Federal capital and a general betterment of business conditions throughout the Republic. At Asuncion many new buildings are in course of erection, the streets are being paved, and the suburbs extended. Business is reported good in every branch of industry, and the future for agriculture and stock raising in the Republic was never more promising. — — —A bill has been introduced into Congress providing for the erection of a PENITENTIARY and jail for women which, according to newspaper reports, will probably receive the approval of Congress. — ——Press reports state that the President of the Republic proposes to soon issue a decree regulating the operation of WIRELESS telegraph stations in the Republic in time of war.———Advices from Asuncion have been received to the effect that the Lloyd Brasileiro Steamship Co. have arranged to place in service a STEAMER to ply between Asuncion and Corumba.— ——A shipment of 1,300 yearling CALVES was recently made from Trinidad Landing to the Argentine Republic.———Tests of domestic CEMENT made in Asuncion were most

satisfactory, and show that a good quality of Portland cement can be made in the Republic and placed on the market at a lower rate than the imported article.———On the 14th of last May the Republic of Paraguay celebrated the one hundred and fifth ANNIVERSARY of its independence.———Leaders of the radical party have held a number of meetings in Asuncion with the object of establishing a new DAILY NEWSPAPER in the Federal capital.

PERU

An executive decree of June 5, 1916, provides for the organization of a COMMISSION consisting of the secretary of the treasury, chairman, the president of the Board of Trade of Lima, the director of customs and taxes, the manager of the tax collection office, the manager of the Salt Co. of Peru, the president of the Federation of Universal Artisans, the president of the Assembly of United Societies, the president of the General Federation of Workmen, and the chief treasury inspector, who will act as secretary of the commission. The object of the commission is to propose means and measures tending to stimulate the importation and national production of ARTICLES OF PRIME NECESSITY and to recommend appropriate measures for securing a supply of foodstuffs, and the sale of same to the consuming public at reasonable prices.———By virtue of a recent executive decree EXPORTS OF BULLION "cementos," mattes, and in general all products containing silver, will only be permitted when they are covered by a certificate of origin issued by the engineer of the metallurgical establishment and approved by the chief of the mining company, mentioning the name of the mine from which the ores were taken as well as the place where they were smelted or treated. The Government reserves the right to issue such decrees and orders as it may deem necessary to prove the correctness of the declarations.———The Pimental to Pomalca RAILWAY has been authorized by the Government, under certain conditions to establish a provisional passenger and freight traffic over the constructed section of the line. The maximum velocity of trains is 30 kilometers per hour between Pimental and Chiclayo, and 20 kilometers between Chiclayo and Pomalca.———The executive power has approved an agreement made on May 22, 1916, between the secretary of the treasury and the following banks: Peru and London, Italian, International of Peru, Popular, German Trans-Atlantic and the Lima Savings Bank. The agreement contains three clauses which obligate the Government to exchange BANK NOTES (circular checks) at par for gold coin for payments made on account of the loan of £500,000, and said banks agree to increase their gold guaranty for the issue of bank

notes (circular checks) in the proportion to the amount exchanged. The Bank of Peru and London has increased its guaranty of bank notes (circular checks) to £198,433.———The company operating the guano deposits of Peru has declared a dividend of 25 centavos per share for the second half of 1915.———A presidential decree of May 24, 1916, convokes the NATIONAL CONGRESS in regular session on July 28, 1916.———The National Government has begun an active propaganda for the encouragement of the cultivation of WHEAT in different parts of the Republic, and proposes to expend for this purpose up to 3,000 Peruvian pounds.———The Government of Venezuela has conferred upon President Pardo the DECORATION of the "Busto del Libertador" (Bust of the Liberator) of the first class and upon Enrique de la Riva Agüero the same decoration of the second class. ———The executive power has ordered MUNICIPAL ELECTIONS throughout the Republic to be held in December next in accordance with the law. The officials to be elected will occupy their respective posts on January 1, 1917.———On May 16 last there was unveiled in the city of Cuzco with imposing ceremonies a MONUMENT in honor of Commander Ladislao Espinar, a native of Cuzco, who was killed in the war of 1879. The authorities, the local educational institutions, colleges, and schools took part in the exercises, which consisted of a procession and speech making, and the National Government declared that day a holiday in Cuzco.———A decree of the President of the Republic provides for the establishment of SCHOOL RIFLE CLUBS in public and private schools of secondary instruction.———The press of Lima announces that the Government has received official notice from the board of directors of the Danish STEAMSHIP Co. of the establishment of a direct line of vessels between Copenhagen and Callao, via, alternately, the Strait of Magellan and the Panama Canal.———The provincial power of Cuzco has taken charge of the erection of a MONUMENT in Regocijo Plaza of that city in honor of the celebrated Peruvian historian Garcilaso de la Vega, a native of the Inca capital. The corner stone of the monument is to be laid during the approaching annual festivities in honor of national independence.

SALVADOR

The commission of the Government of Salvador appointed to take part in fixing the PERMANENT BOUNDARY LINE between the Republics of Salvador and Honduras, is composed of Dr. Rafael Antonio Crellana, and engineers Francisco Espinal and Pedro Fonseca. The mission of Honduras, appointed for the same purpose, is made up of Dr. Rómulo Durón, and engineers Medardo Zuñiga and Luis

Paz. These commissions will soon meet in the town of Anamoras, Republic of Salvador, to begin the work for which they have been selected.———A decree of the National Legislative Assembly permits FREE ENTRY into the Republic of shipments of Peruvian bark in pieces or powder, sulphuric acid and quinine (quinina en bruto).———In view of the fact that the cutting down of the FORESTS of the country, regardless of the prohibition of the land and municipal laws, has tended to dry up or diminish the flow of water from the springs and streams that supply many of the towns and plantations of the Republic with this necessary fluid, thereby causing inconvenience to communities and injury to agriculture, the President has requested the governors of the respective departments, in cooperation with the mayors of the towns, the forest guards and the local landowners, to engage, from the 3d to the 15th of May of each year, in a systematic replanting of the denuded areas, giving special attention to places where there are now or formerly existed springs or depressions which give rise to streams and water courses.———The construction of a NATIONAL HIGHWAY between the cities of Santa Ana and Nueva Concepcion, which road crosses the Lempa River, was commenced during the latter part of May of the present year.———The Mercedes R. de Meléndez COLLEGE FOR GIRLS at Chalchuapa was officially opened for service, under the auspices of the municipal authorities of that town, on May 14, 1916.———Gustavo A. Ruiz, consul general of Salvador in Buenos Aires, represented his country at the CENTENARY CELEBRATION of the proclamation of Argentine independence on the 9th of the present month.———La Prensa, a daily newspaper of the city of San Salvador, announces the discovery of a GOLD MINE reputed to contain abundance of rich ore, near the town of El Carmen, district of La Union. The same publication also states that valuable PETROLEUM deposits have been encountered in the department of Morazan.———According to press reports a plantation owner in the department of San Miguel is setting out 1,000,000 HENEQUEN plants with the object of engaging in that industry on a large scale.———About the middle of last May construction work was begun on the ZACATECOLUCA STATION of the International Railway.———The President has decreed a strict observance of the law requiring EXPORT TAXES to be collected on the weight of the products exported specified in kilos, and requiring customs administrators to refuse to pass shipments covered by documents which fail to comply with this provision of the law. The reports of customs administrators to the General Bureau of Statistics of the Government of Salvador for the sake of uniformity must show weights in kilos.———The National Legislative Assembly has modified the law governing the manufacture and sale of ARMS, EXPLOSIVES, etc., in the Republic so as to require an annual payment of 100 pesos for each main

office or factory, and 50 pesos for each branch office or factory if located in the same department, but if situated in different departments then each branch office or factory is required to pay the full quota of 100 pesos annually. If, however, branch offices or factories are maintained in the same city in which the principal office or factory is located, they are required to pay an annual tax of 25 pesos each.

The general BUDGET of receipts and expenditures of the Government of Uruguay for the fiscal year 1916–1917 estimates the receipts at 29,086,428 pesos, and the expenditures at 29,406,445, leaving an estimated deficit of 320,017 pesos. The expenditures are made up of the following items: Legislative power, 706,812 pesos; presidency, 69,244; interior, 3,277,982; foreign affairs, 511,735; finance, 2,104,248; public instruction, 3,276,972; industries, 848,393; public works, 1,376,500; war and marine, 5,185,549; judicial power, 383,712; public debt, 8,506,349; sundry credits, 797,672; and pensions, etc., 2,361,277. The principal items of estimated revenue are as follows: Customs duties, 12,500,000 pesos; property tax, 4,160,000; license tax, 1,600,000; tax on alcohol, matches, beer, tobacco, sugar, wines, spirits, medicines, live stock, and inheritances, 3,890,000; and stamp and other taxes, 7,376,428.———The Government has introduced into Congress a bill modifying the present system of SECONDARY AND PREPARATORY EDUCATION. The curriculum is divided into two periods or grades; that is to say, a general course of four years and a complementary one of two years. The first period gives preference to the study of natural science, modern languages, agronomy, and bookkeeping, while the second period pays attention to particular subjects not included in the first period.———The amended IMPORT CONSULAR REGULATIONS of the Government of Uruguay require freight lists to specify the class and name of the vessel, name of the captain, flag under which the vessel sails, registered tonnage, total tonnage of cargo for each port of the Republic, name of port of origin and of port of destination in the Republic, number of bill of lading, marks, numeration and number of bales, class and contents, gross weight or measurement as the case may be, names of shippers and consignees, and the declared value of the goods in Uruguayan currency, in accordance with the respective bills of lading or certificates of origin.———The annual STOCK FAIR under the auspices of the Rural Association of Uruguay will be opened at the Prado in Montevideo on August 25, 1916. Steps have been taken to make this fair one of the best of its kind ever held in the national capital. Im-

provements of a permanent nature are planned at the fair grounds, inasmuch as the Rural Association proposes to hold at some time in the near future an international stock fair in Montevideo.———The President of the Republic has delivered a message to Congress recommending an appropriation of 18,000 pesos for the purpose of supplying the town of Lacaze with POTABLE WATER.———An administration bill has been introduced into Congress authorizing the establishment of a NATIONAL SCHOOL OF PAINTING AND SCULPTURE. The school proposes to impart theoretical and practical instruction free in drawing, painting, engraving, sculpture, and architecture, and intends to maintain popular courses for the encouragement of artistic culture. It is reported that after the school is in operation the subvention now given by the Government to private art schools will be discontinued.———A contract has been made by the Government of Uruguay with Angel Zanelli, an Italian sculptor, for the erection of a monument in Montevideo in honor of the Uruguayan patriot, JOSE G. ARTIGAS. The monument will be in accord with the drawings submitted by the sculptor in a competitive contest, and is to be completed within three years.———The NATIONAL LIBRARY in Montevideo celebrated on May 25 last the hundredth anniversary of its existence.———La Campaña, a daily evening paper published in the city of Artigas, advocates the growing of TOBACCO in that department, which possesses a soil said to be capable of producing high-grade and finely-flavored tobacco leaves.———The net receipts of the MONTEVIDEO WATER-WORKS in 1915 were ₱120,493.

VENEZUELA

On May 29, 1916, Dr. Felipe Rincón González, a priest of the parish of San Cristobal, was elected by the National Congress ARCHBISHOP OF CARACAS AND VENEZUELA. The selection has been approved by the people of Venezuela with manifestations of great joy.———The board of directors of the Fluvial & Coastwise Navigation Co. of Venezuela called a special meeting of the stockholders of that company in May last for the purpose of securing approval for an ISSUE OF BONDS to the value of 800,000 bolivares (1 bolivar = $0.193) for the purchase of three steamships to be used in the service of the company.———In accordance with the provisions of the rules and regulations of the National Academy of Medicine of Caracas, that institution of learning has opened its register to candidates who desire to participate in the annual competitive test for the VARGAS PRIZE for 1915, consisting of a gold medal and 1,000 bolivares in cash, to be awarded for the best essay on one of the following topics: Kalazar, beriberi, carates (a skin disease which

prevails among the Negroes in the Tropics).———On April 30 last, work was commenced by the organizing committee of the Second Venezuelan MEDICAL CONGRESS which will be held in Caracas some time during the present year, the exact date to be determined later.———The Venezuelan press states that a foreign company has taken preliminary steps toward exploiting the CARBONATE OF MAGNESIA DEPOSITS found in the municipality of Lares.———At the beginning of May, 1916, the work of repairing the LEVEE to the east of Ciudad Bolivar, thrown up to keep out the waters of the Orinoco River, was finished. This will in future prevent the eastern part of the city from being flooded.———Reports state that Valencia & Modiano, of Porlamar, Margarita Island, have ordered a modern COTTON GIN from New York to be used in the ginning and baling of the cotton crop of that island. These gentlemen also propose to engage in the cultivation of cotton on a large scale on lands purchased by them in the neighborhood of San Antonio, and will drill for artesian water with which to irrigate their cotton plantations.———The Secretary of Public Instruction of Peru has notified the Government of Venezuela that Guillermo Machado Morales and Rafael Figueredo Herrera, Venezuelan students who have scholarships in the School of Mines at Lima, will soon have conferred upon them the degree of MINING ENGINEER.———In March last a shipment of 857,500 kilos of COPPER ORE, valued at 88,625 bolivares, the property of the South American Copper Syndicate, was shipped to New York in the Dutch steamer *Luna*.———An executive order, issued in accordance with the terms of the contract made by J. P. Cuéllar, with the Executive Power, authorizes, solely, Mr. Cuéllar, or his representatives or assigns, to export through the customhouses of the Republic CHICLE extracted from the pendare tree.———During the first two weeks of May of the present year Gen. Juan Vicente Gómez, President elect of Venezuela, officially opened to public traffic TWO IMPORTANT HIGHWAYS, one of which, 50 kilometers long, runs from Caracas to Guatire, and the other, 59 kilometers long, from Maracay to Ocumare on the coast. During the same period Gen. Gómez also opened to public use the Tacarigua SUGAR CENTRAL situated on the banks of Lake Valencia, and the new Maracay electric-light plant, which furnishes light and power to that city and the industrial establishments of the surrounding country.———According to the report of the department of public works, great activity is being shown in repairing the following CART ROADS: The Tachira Central from Caracas to La Guaira; from Caracas to Charallave; from Villa de Cura to San Juan de los Morros and Calabozo; from Caracas to Valencia; from Puerto Cabello to San Felipe; from Cunana to Cumanacoa; from Cumarebo to Vela; and from La Guaira to Macuto.